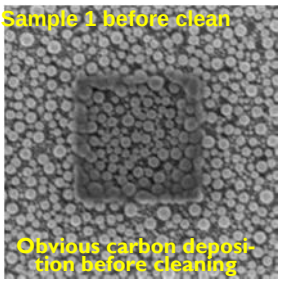
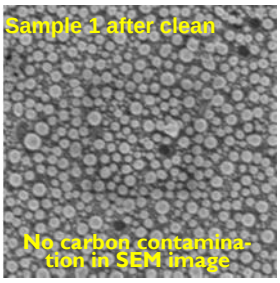
Remote plasma cleaners

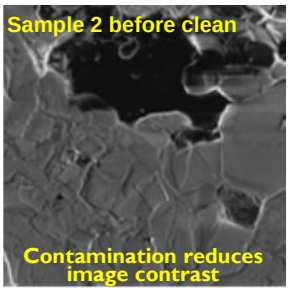
For SEM, FIB, TEM, XPS, ALD , CD-SEM, EBR, EBI, EUVL and other high vacuum system. Clean vacuum chamber and samples at the same time!

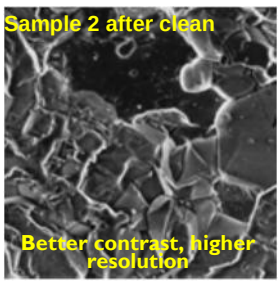
Address: 63 Bovet Rd, Suite 106, San Mateo, CA, 94403, U.S. A.

Cleaning effect:









EM-KLEEN | SEMI-KLEEN quartz | SEMI-KLEEN sapphire

Remote plasma sources from PIE Scientific

Desktop and rackmount controller

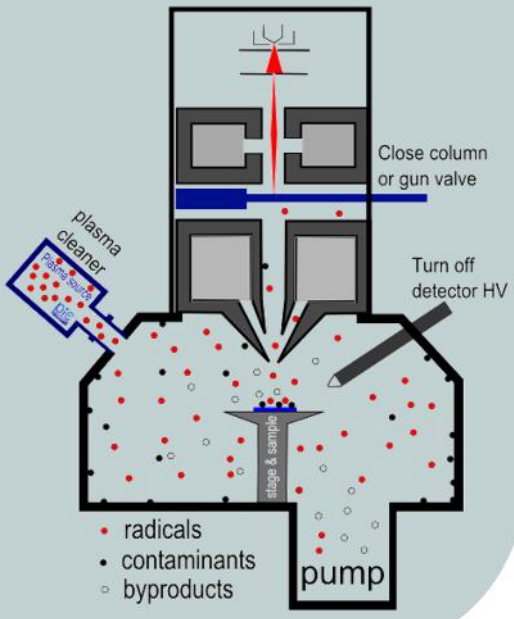
Impact of contamination to electron microscopes and other high vacuum systems

Lubricant, vacuum grease, pump oil, polymer containing samples, or untreated air can all introduce hydrocarbon contaminations into vacuum systems. Low vapor pressure high molecule weight contaminants can condensate on sample surface and on chamber wall. Hydrocarbon contaminants are extremely difficult to be removed with conventional gas purging methods.

Electrons and energetic photons (EUV, X-ray) can breakdown hydrocarbon contaminants that exist in vacuum systems or on samples. The byproducts can be hydrocarbon deposit on irradiated sample surface or on exposed instrument components. It degrades EUV mirror reflectivity, reduces SEM image contrast and resolution, generates wrong surface analysis results, and even causes e-beam position and focus drift in slow scan if non-conductive hydrocarbon deposits on apertures or other electron optics components. In ALD system, hydrocarbon contaminants acquired during organic solvent cleaning or air exposure can reduce interface quality of the films.

Principle of remote plasma cleaning

Remote plasma source should be installed on the vacuum chamber to be cleaned. Controller provides the RF power to the remote plasma source. RF energy breaks down the process gas that contains oxygen, hydrogen or other process gases and generates reactive radicals. Radical species will then diffuse into the chamber to be cleaned and react with the contaminants. The byproducts are usually low molecule weight, high vapor pressure molecules that can be easily pumped away. Remote plasma cleaner can clean vacuum systems and samples at the same time.



Contact
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FAX: 650-240-8671
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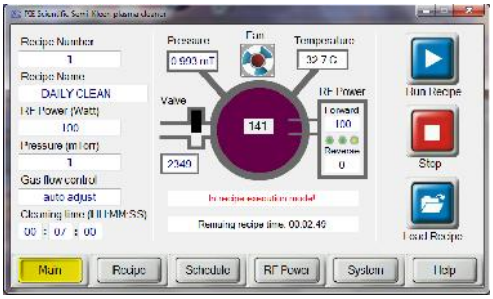
www.piescientific.com

INTELIGENT REMOTE PLASMA CLEANING SYSTEMS

Spec and features:

Remote plasma sources	EM-KLEEN	SEMI-KLEEN quartz	SEMI-KLEEN sapphire
Applications	SEM, FIB, TEM, XPS, SIMS, AES	SEM, FIB, TEM, CD-SEM, EBR, EBI, XPS, SIMS, AES	ALD, EUVL, for NF3, CF4, NH3, H2, HF, H2S plasma
Chamber material	Quartz tube	Quartz tube	Sapphire tube
RF power	0-75Watt	0-75Watt or 0-100Watt	0-75Watt or 0-100Watt
Operation pressure	0.001~5 Torr	0.0001~5 Torr	0.0001~5 Torr
Impedance matching	Fixed	Fixed or auto match	Fixed or auto match
Low particle design for semicon-ductor applications	Not available	Available	Available
Corrosive gas compatibility	Not compatible	Not compatible	Compatible
Pressure sensor	Advanced pirani sensor, range: 10^{-4} torr to 760 torr		
Plasma sensor	Proprietary plasma strength sensor		
Gas flow control	Electronic control, 0~50sccm		
Recipe support	60 customizable recipes		
Controller	Desktop controller or 19" rackmount controller		
Vacuum interface	NW/KF40, CF2.75" option available		
Vacuum level	Low 10^{-7} Torr range		
PC remote control UI	RS232/RS485, windows .Net Framework 4.0 or higher		



Intuitive touchscreen control

Unrivaled protection

- ◊ **2 years warranty.**
- Ğ **Return anytime!**
- Ğ **Made in U.S.A**

Advanced and unique features

- Clean typically contaminated SEM samples with 6 minute or less time. Clean ALD samples with hydrogen plasma for 2 to 60 seconds. No need to slow down or turn off turbo pump.
- Low plasma potential design reduces ion sputtering and particle generation. Together with proprietary multi-stage gas filtering technique, SEMI-KLEEN can meet the toughest particle requirement from semiconductor customers like Intel, TSMC and Samsung.
- Option to support corrosive plasma such as CF4, NF3, NH3, HF, H2S etc. with sapphire plasma tube and corrosive gas compatible flow controller.
- Unique plasma strength sensor monitors plasma status in real-time. Users are not blind to plasma status anymore!
- Automatic electronic gas flow control based on pressure sensor feedback control. No need to manually adjust needle valve.
- Intuitive touchscreen control with 60 customizable recipes.
- Intelligent safe operation mode and expert operation mode.
- SmartSchedule™ cleans your systems automatically based on number of sample loading events or time interval.
- Low EMI design, quiet standby mode.

Applications:

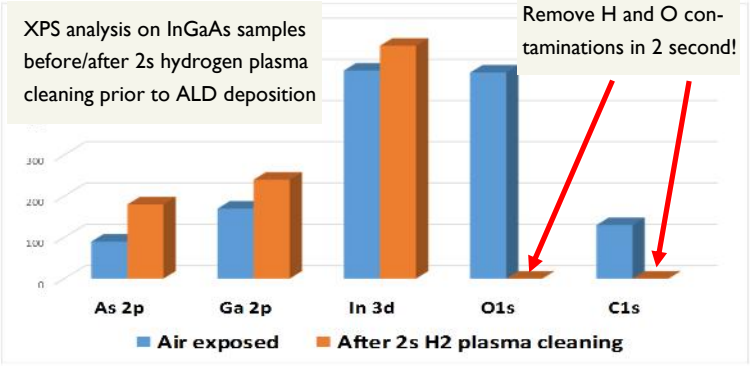
Electron/ion microscopes: SEM, FIB, TEM

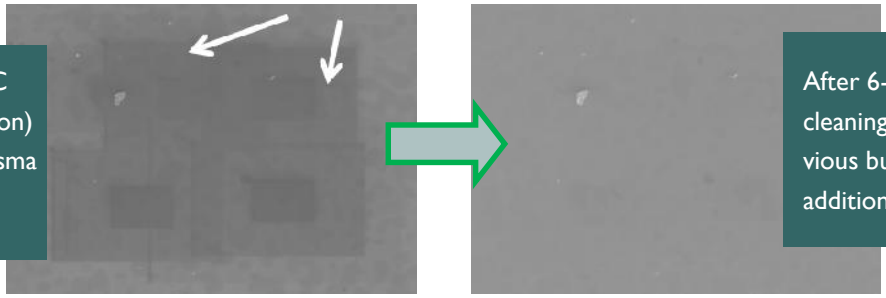
Surface and composition analysis: XPS, AES, SIMS

Deposition system: ALD, CVD

Lithography: EUVL, EBL

Scientific research: etching, cleaning, deposition





Contaminated DLC (diamond-like carbon) samples before plasma cleaning

After 6-min plasma cleaning. Remove previous burnmarks, No additional scan mark.

Accessories:

NW/KF40 flange adapters

Three-port gas mixer