

TRION TECHNOLOGY

Manufacturer of Plasma Etch & Deposition Systems since 1989

Trion manufactures a variety of systems for the Compound Semiconductor, MEMS, Opto-Electronic and other markets. Our products feature the smallest footprint and lowest cost systems in the industry with proven production reliability. If you wish anything from full-blown production cluster tools to a simple laboratory system, Trion makes it.

PRODUCTION

STRIP



Gemini
Multiple Process Module
Stripper

The cost of new stripping systems has escalated to unreasonable levels. Trion has solved this critical problem with two inexpensive, compact and versatile systems: The **Gemini** and **Apollo**.

By employing ICP, microwave and RF bias power as needed, difficult to remove layers of resist can be removed at low temperatures. As required by application, each system can incorporate the SST-Lightning microwave source (which is both reliable and free from typical microwave tuning problems) or ICP technology.

- 100mm - 300mm wafers
- Etch rates up to 6um/min
- High-throughput
- Low plasma damage
- Self tuning



Apollo
Single Process
Module Stripper

ETCH/DEPOSITION



Titan - shown with ICP option

The **Titan** is a very compact, fully automated, vacuum loadlocked plasma system for semiconductor production.

The Titan is available in either Reactive Ion Etch (RIE) configuration, High Density Inductive Coupled Plasma (HDICP) or Plasma Enhanced Chemical Vapor Deposition (PECVD) configuration. Used for advanced processing of single wafers or mounted parts (3" - 300mm). It also has multiple size batch capability. Small footprint at an affordable price.

Etch applications:

Gallium arsenide, aluminum gallium arsenide, gallium nitride, indium phosphide, aluminum, silicides, chrome and other materials requiring both corrosive and non-corrosive chemistries.

Deposition applications:

Silicon dioxide, silicon nitride, oxynitride, and various other materials.

PRODUCTION

The **Oracle III** is the smallest full production cluster system on the market.

It consists of a central vacuum transport (CVT), vacuum cassette elevators and up to four process reactors. These process reactors are docked to the central loadlock and run in production-mode or can be operated independently as stand-alone systems. The Oracle III can be configured for either the laboratory environment (single wafer loading) or for full production (vacuum cassette elevators) making it the most flexible system on the market.

Because the Oracle III accommodates up to four separate process chambers, there are many possible process combinations, including RIE/ICP etch and PECVD deposition. Multiple chambers can be run at the same time. Processes are safely run without atmospheric contamination since all chambers are vacuum loadlocked.



Oracle III: Cluster Plasma Etch and/or Deposition System

ETCH/DEPOSITION

PILOT LINE/SMALL PRODUCTION



Minilock-Orion III PECVD

The **Minilock-Orion III** is a state-of-the-art Plasma Enhanced Chemical Vapor Deposition (PECVD) system.

The system's bottom electrode is available in either 200mm or 300mm sizes and depending on electrode configuration, can process single wafers or mounted parts (3" - 300mm), or multiple-size batch wafers (4x3"; 3x4"; 7x2").

The Minilock-Orion III is used for toxic/pyrophoric PECVD processes. Films deposited: oxides, oxynitrides, nitrides, amorphous silicon and silicon carbide. Process gases: 100% silane, ammonia, TEOS, diethylsilane, nitrous oxide, oxygen, nitrogen, trimethylsilane and methane.

A Triode or inductively-coupled plasma (ICP) source is offered as an option for this tool. The Triode allows the user to create higher density plasma and thereby control film stress.

Samples are loaded into the process chamber via the vacuum loadlock. This feature increases user safety by preventing contact with the process chamber and any residual deposit by-products. The loadlock also allows the chamber to remain permanently under vacuum thereby keeping the reaction chamber isolated from the atmosphere.

DEPOSITION

PILOT LINE/SMALL PRODUCTION

The **Minilock-Phantom III** is a Vacuum Loadlocked Reactive Ion Etcher (RIE).

It is designed to supply laboratories and pilot line production environments with state-of-the-art etch capability using single wafers or mounted parts (3" - 300mm). It also has multiple size batch capability (4x3"; 3x4"; 7x2").

The system has up to seven process gases which are used to etch films such as silicon oxide, silicon nitride, polysilicon, aluminum, gallium arsenide, chrome, copper, indium phosphide and titanium. This reactor can also be used to strip photoresist and other organic materials. An electrostatic chuck (E-chuck) is offered as an option to more effectively keep the wafer cool during the etch process. This E-chuck uses a helium pressure controller to build up a cooling layer of helium on the backside of the wafer.

An inductively coupled plasma (ICP) source is offered as an option for this tool. The ICP allows the user to create a higher density plasma and thereby increase etch rates and anisotropy.

Samples are loaded into the process chamber via the vacuum load lock. This feature increases user safety by preventing contact with the process chamber and any residual etch by-products. The load lock also allows the chamber to remain permanently under vacuum thereby keeping out moisture and keeping the reaction chamber free of possible corrosion.



Minilock-Phantom III RIE
shown with ICP option

ETCH

LAB/R&D/F.A.



Orion III PECVD

DEPOSITION

The **Orion III** Plasma Enhanced Chemical Vapor Deposition (PECVD) system is designed to supply laboratories and pilot line production environments with state-of-the-art deposition capability using single wafers, dies or parts (2" - 300mm).

The Orion III system is used for non-pyrophoric PECVD processes. Films deposited: oxides, oxynitrides, nitrides and amorphous silicon. Process gases: <20% silane, ammonia, TEOS, diethylsilane, nitrous oxide, oxygen and nitrogen.

An ICP or Triode source is offered as an option for this tool. The Triode allows the user to create higher density plasma and thereby control film stress.

Samples are loaded into the process chamber by opening the lid and placing wafers on the electrode surface, or "chuck."

LAB/R&D/F.A.

ETCH



Phantom III RIE

The **Phantom III** Reactive Ion Etch system is designed to supply labs with state-of-the-art plasma etch capability using single wafers, dies or parts up to 300mm diameter.

The system has up to seven process gases which are used to etch nitrides, oxides and any films or substrates requiring fluorine-based chemistries (such as carbon, epoxy, graphite, indium, molybdenum, oxynitride, polyimide, quartz, silicon, oxide, nitride, tantalum, tantalum nitride, titanium nitride, tungsten and titanium tungsten). This reactor can also be used to strip photoresist and

other organic materials. An electrostatic chuck (E-chuck) is offered as an option to more effectively keep the wafer cool during the etch process. This E-chuck uses a helium pressure controller to build up a cooling layer of helium on the backside of the wafer.

An inductively coupled plasma (ICP) source is offered as an option for this tool. The ICP allows the user to create a higher density plasma and thereby increase etch rates and anisotropy.

Samples are loaded into the process chamber by opening the lid and placing wafers on the electrode surface, or "chuck."

ETCH



Sirus T2 RIE

The **Sirus T2** Reactive Ion Etcher (RIE) is a basic table-top plasma etching system designed for dielectrics and other films that require fluorine-based chemistries.

The small footprint and robust design make it ideal for the lab environment. It can process single wafers or mounted parts up to 200mm in diameter.

Safety:

Trion tools follow SEMI S2-93 safety requirements. A third party safety review is available upon request.

Facilities:

Facility schematics can be provided upon request.

Process Support:

Trion tools come with full process support both prior to and subsequent to purchase. For a more detailed discussion of applications and processes, please visit www.triontech.com.



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