TRION TECHNOLOGY

Over 30 Years of Innovation

Trion manufactures a wide variety of plasma etch and deposition systems for the compound semiconductor, MEMS, optoelectronic, and other markets. Our products feature the smallest footprint and lowest cost systems in the industry with proven production reliability. If you wish for 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.

- 100 mm-300 mm 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), or 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”-300 mm). 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

ETCH/DEPOSITION

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

Oracle
Cluster Plasma Etch/Deposition System

PILOT LINE/SMALL PRODUCTION

DEPOSITION

Minilock-Orion PECVD System

The **Minilock-Orion** is a state-of-the-art loadlocked plasma enhanced chemical vapor deposition (PECVD) system.

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

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.

PILOT LINE/SMALL PRODUCTION

ETCH

The **Minilock-Phantom** is a vacuum loadlocked reactive ion etch (RIE) system.

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”-300 mm). 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 loadlock. This feature increases user safety by preventing contact with the process chamber and any residual etch by-products. The loadlock also allows the chamber to remain permanently under vacuum, thereby keeping out moisture and keeping the reaction chamber free of possible corrosion.

Minilock-Phantom RIE System
shown with ICP option

LAB/R&D/F.A.

DEPOSITION

Orion PECVD System

The **Orion** 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 up to 300 mm.

Films deposited:
Oxides, oxynitrides, nitrides, and amorphous silicon.

Process gases:
<20% Silane, ammonia, TEOS, diethylsilane, nitrous oxide, oxygen, and nitrogen.

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 by opening the lid and placing wafers on the electrode surface, or “chuck.”

LAB/R&D/F.A.

ETCH


Phantom RIE System

The **Phantom** reactive ion etch (RIE) system is designed to supply labs with state-of-the-art plasma etch capability using single wafers, dies, or parts up to 300 mm.

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.

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Safety:
Trion tools follow SEMI S2-0310/S8-0308 and CE Marking 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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