

GEMStar XT-S/DP™ PEALD/Thermal ALD System



Molecular Innovation™

The GEMStar XT™ platform is the industry's only true benchtop Atomic Layer Deposition (ALD) System, now more configurable to meet our Customer's needs and budgets

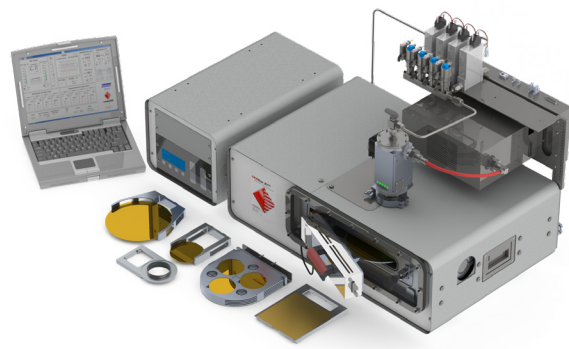
GEMStar XT™ family produces best in class ALD films from high aspect ratio particles through 200mm substrates both in single substrate and batch modes of operation

The GEMStar XT-DP™ Plasma Enhanced Atomic Layer Deposition (PEALD) system extends the capabilities of the GEMStar XT™ Thermal system to include best in class plasma processing through the full range of substrates.

Configured with a 300 Watt air cooled direct Inductively Coupled Plasma (ICP) RF system with four mass flow controlled gas inputs, either single (S) or dual (D) 200 °C manifold zones, four (S) or eight (D) high speed material ALD valve ports (one with vapor push technology), two locatable 200°C material temperature zones and an external gas interface, the GEMStar XT-DP™ system is a powerful plasma enabled tool to extend your research and processing requirements to the next level.

Some key features of the system include:

- ◆ 300-Watt Air Cooled Direct ICP Head with four metal sealed mass flow-controlled plasma gas inputs
- ◆ Adjustable reactor temperature up to 300°C
- ◆ Up to 200°C uniform gas distribution delivery
- ◆ Pulsed Vapor Push (PVP™) to handle very low-pressure material
- ◆ Substrate configurable end effectors up to 200 mm diameter substrates, as well as a 450°C heated platen option
- ◆ User selectable carrier gas MFC controlled input up to 200 SCCM
- ◆ Field proven GEMFlow™ Control System



Ease of Operation

The Arradiance GEMFlow™ Software provides complete user control over all key operating parameters such as temperature, gas flow rate, high-speed ALD valves, RF Power and vacuum isolation.

- ◆ Preloaded on business level Windows® Laptop

User created processes can be saved enabling substrate to substrate and batch to batch consistency without sacrificing flexibility

- ◆ Diagnostic system and logging creates traceable data of all system parameters during operation
- ◆ Internal GEMStar XT USB control module

Safety

GEMStar XT Systems are designed to be SEMI S2 Compliant where applicable without sacrificing the needs of material research and development needs

- ◆ CE Compliant, CSA Optional
- ◆ Watchdog protection and EMO interface
- ◆ Operator touch safe exterior
- ◆ RGIP™ Reactor Gas Injection Protocol avoids accidental, unwanted, or unsafe chemical material reaction for all gas injection ports for simple and complex nanolaminate processes

Serviceability

Modular ergonomic design with top panel access to all critical components

- ◆ Fast precursor changes and reconfiguration
- ◆ Easy access power, vacuum and gas connections
- ◆ Perfectly suited for glove box configuration

GEMStar XT-S/DP™ PEALD/Thermal ALD System

| Specifications | |
|-------------------------------------|---|
| System Dimensions | Main - 25" H x 32" W x 24" D designed to fit on desktop, lab bench or glovebox Half Rack - 11"H x 12"W x 21"D for RF Power Supply |
| Door Mounted Substrate End Effector | Specify end effector diameter at time of order (200 mm default, 150 mm, 100 mm) Other sizes or batch cassettes available on request |
| Reactor/Door Thermal Zones | Two controllable zones up to 300 °C ± 1 °C Optional 450 °C Processing available on request |
| RF Plasma Source | 300 W ICP Air Cooled Power adjustable head with automatic tuning Four mass flow controlled (MFC) plasma gas inputs with automatic pneumatic safety normally closed valves |
| Material Manifold | Single (S) or Dual (D) controllable manifold zone up to 200 °C Four (S) or Eight (D) High Speed ALD Valve Controlled Material Ports Single Pulsed Vapor Push (PVP™) Zone controlled by High Speed ALD Valve |
| Material Bottle Heated Zones | Up to four movable zones up to 200 °C |
| Material Bottles | Up to four or six (2 STD) DOT certified 150 ML Bottles with bellows sealed valves |
| External Gas Input | Main System - Up to 4 (2 STD) Inputs for external user selectable gasses RF System – 4 inputs, 3 are user selectable for Plasma gas inputs |
| Inert Carrier Gas | Mass Flow Controlled up to 200 SCCM |
| Control System | GEMFlow™ Control Software Windows® Professional 64-bit Laptop GEMStar XT™ USB control module |
| RF Power Supply | 11"H x 12"W x 21"D Half Rack |
| Metrology Port | Spare NF-40 In Line metrology port for QCM or other customer needs |
| Vacuum Gauge | Convection Vacuum Gauge Optional ALD Insensitive Capacitive Monometer Gauge |
| Equipment Safety | |
| Emergency Off | Standard DB9 port to support EMO or other safety shut down requirements |
| Touch Safe | All Exterior Components thermal and electrical |
| Watchdog | System shuts down to Safe mode if communication is lost with computer |
| Normally Closed Vales | All internal valves close when power removed |
| Certification | CE Marked Designed to comply with applicable SEMI S2 guidelines CSA optional on request |
| Facilities Requirements | |
| Carrier Gas | Ar 10-20 psig regulated VCR-4 Type Connection |
| Plasma Gases | Four 10-20 psig regulated VCR-4 Type Connection Note: System comes with above carrier gas also connected to PEALD MFC port 1 |
| CDA (Clean Dry Air) | 80 psig ± 5 psi regulated |
| AC Power | Main System – Dedicated 110-120 VAC 50/60 Hz 20A RF System – Separate Dedicated 110-120 VAC 50/60 Hz 20A |
| System Weight | < 275lbs including plasma system components |
| Vacuum Pump (optional) | KF 50 Vacuum Connection ≥ 35 cfm Dry Pump |