CambridgeNanoTech
Simply ALD

Phoenix System

At Cambridge NanoTech, we simplify the science of atomic layer deposition (ALD) and apply it to solve complex thin film challenges. As the leading ALD solution provider to researchers and manufacturers worldwide, we are redefining the field with versatile turnkey systems and expert services. Our ALD solutions enable unsurpassed coatings on virtually any surface or substrate to meet the needs of today's manufacturing environments including high-throughput, large-surface area, and batch.

Precision.

The Phoenix uses our proprietary precursor delivery system to deposit films on surfaces. This unsurpassed precision delivers an accurate, uniform coating thickness every time, for superior film quality and repeatable results on all of your production runs.

- **Precise process control.** Exact control of process parameters including temperature, f ow, and pressure. With support of up to six individual precursor lines, the Phoenix delivers solid, liquid or gaseous process chemistries depending on your specific thin film requirements.
- **Defect-free coating process.** Our low-temperature, low-stress coating processes, based on self-limiting monolayer growth, achieve a uniform, pin-hole free coating with superior adhesion on even the most sensitive substrates.
- **Control software.** Precise thin films come from precise control. Our proven Graphical User Interface (GUI), with real-time control of system parameters, is powerful, yet simple to use. The Phoenix control software is automation-ready and delivers state-of-the-art connectivity to any manufacturing system.

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Performance.

Engineered for high throughput and maximum uptime, the Phoenix ensures repeatable, highly accurate film deposition, from batch to batch, for your manufacturing operations.

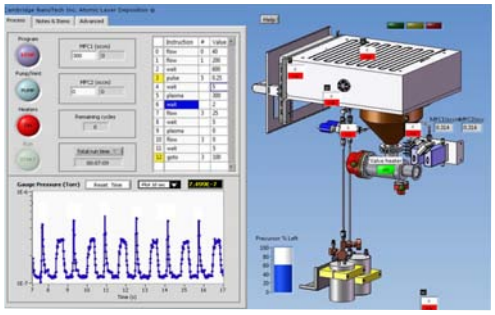
- **High productivity batch mode.** Proprietary fast-pulse ALD valves deliver precursor input for even distribution and f ow through the reactor, for high quality film results without compromising throughput. With its large process chamber, the Phoenix can coat up to five GEN 2.5 FPD substrates, multiple wafer cassettes, and large 3D objects.
- **Rapid thermal recovery time.** The Phoenix takes only minutes to return to operational chamber temperature, getting you up and running quickly for processing your next batch.
- **4000 hours Mean Time between Failures (MTBF).** High MTBF means you spend more time coating high quality thin films and less time maintaining your ALD system.

The Practical Choice.

Designed by experts who have consistently engineered innovative ways to simplify the ALD process and yield extraordinary thin film results, the Phoenix system is a practical choice for high-throughput batch production environments.

- **Low cost of ownership (COO).** Low startup and operational costs combined with a compact footprint and high-throughput ensures that the Phoenix delivers lowest possible COO.
- **Easy maintenance.** The Phoenix is designed for fast and easy maintenance of wetted surfaces, including reactor liners and integrated vapor trap, that are chem-cleanable and easily removed without tools.
- **Compact footprint.** With a compact footprint (656 x 676 mm), the Phoenix conserves valuable clean room space.
- **A complete solution.** Each Phoenix system includes qualified recipes and prepackaged chemistries that have been proven on

System Specifications	
Substrate size	Gen 2.5 FPD - 370 x 470 mm 52 wafers - 100 mm (cassette) 52 wafers - 150 mm (cassette) 52 wafers - 200 mm (cassette) 13 wafers - 300 mm (cassette)
Dimensions (w x d x h)	656 x 676 x 1717 mm
Cabinet	Stainless steel vented cabinet with smoke detection
Precursor Valves	High speed pneumatic pulse (15 msec) with continuous purge
Carrier/Venting Gas	N_2 mass flow controlled, 50-500 SCCM
Power	208 VAC 3 Phase, 1900 W
Control	Labview™, USB, Windows™ PC
Substrate Temperature	85 °C - 285 °C, Uniformity: <2%, 1 hour heatup from room temperature
Deposition Uniformity	<3% (Al_2O_3)
Throughput (Al_2O_3)	Cycle Time <30 secs for 25 wafers Cycle Time <40 secs for 52 wafers
Compatibility	Cleanroom class 100 compatible, but not required
Compliance	CE, FCC and CSA



Phoenix Software

multiple substrates. All Cambridge NanoTech systems are supported by a team of world leading ALD scientists and technologists.

- **Built for safety.** The Phoenix is CE, FCC, and CSA compliant, with a fully-vented steel cabinet, smoke alarm, accidental precursor drip pan, two EMOs, and many other built-in safety features.

ALD Shield

Our Phoenix integrated ALD Shield™ prevents build-up of deposits on the plumbing and the pump by capturing excessive process gases before they reach the pumping system. This saves money in maintenance costs and prevents excess gases from being exhausted to the environment. The ALD Shield's high conductance, hot foil design causes process gases to deposit until depleted. The vapor shield is easily removable for periodic cleaning.

ALD Films and Recipes

Cambridge NanoTech scientists have developed standard materials and recipes that have been proven on multiple substrates. These materials are prepackaged and available from our partners, Strem Chemicals and Sigma-Aldrich SAFC Hitech.

Glovebox Integration

The Phoenix is readily integrated with MBraun™ gloveboxes for handling thin film samples in an advanced inert atmosphere system that is free of oxygen and moisture.

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