CambridgeNanoTech
Simply ALD

Tahiti System

At Cambridge NanoTech, we simplify the science of atomic layer deposition (ALD) and apply it to solve complex thin film challenges. The Tahiti balances the many needs of large-area manufacturing by delivering high-volume performance and precise films in an economical package.

High-Volume Performance.

Engineered for large-area manufacturing, the Tahiti ALD system ensures repeatable, exceptionally uniform film deposition on large Gen 4.5 substrates in high-volume production facilities.

- **Stackable chamber architecture.** A single Tahiti system accommodates two stackable ALD process chambers for a reduced footprint and independently processing two Gen 4.5 substrates at a time.
- **Low-volume, low profile process chamber.** Tahiti's low-volume, low profile process chamber design enables fast precursor purge for reduced cycle times and faster processing.
- **Multiple precursor reservoirs.** Because Tahiti uses multiple precursor reservoirs with level detection and automatic cylinder switchover, manufacturers can count on uninterrupted precursor delivery.
- **Rapid thermal heating.** Substrates reach deposition temperature in as quickly as two minutes after being loaded into the Tahiti's process chambers.
- **4000 hours Mean Time Between Failures (MTBF).** High MTBF means you spend more time depositing high quality films and less time maintaining your ALD system.

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Precise Films.

Designed by experts who have uncovered innovative ways to simplify the ALD process and yield extraordinary film results, the Tahiti uses a proprietary precursor delivery system to coat substrates with precise thin films. The Tahiti delivers solid, liquid, or gaseous process chemistries depending on your specific thin film requirements.

- **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 Tahiti control software is automation-ready and delivers state-of-the-art connectivity to any manufacturing system.
- **Precise process control.** Exact control of all process parameters including temperature, flow, and pressure. Our ultra-high precision precursor system delivers an accurate, uniform coating thickness every time for superior film quality and repeatable results on all of your production runs.
- **Defect-free coating process.** The low-temperature, low-stress coating process, that is inherent to ALD, is based on self-limiting monolayer growth, and achieves a uniform, pinhole free coating with superior adhesion to the interface on even the most sensitive substrates.
- **Laminar flow.** The Tahiti's unique precursor inlet plenum with pre-mixing feature optimizes laminar flow for a uniform deposition and reduces the cycle time by decreasing process gas purge times.

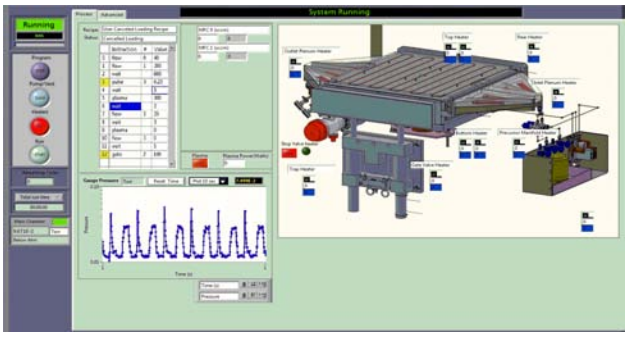
Ease of Integration and Ownership.

Cambridge NanoTech is uniquely qualified to transform the science of ALD into practical, state-of-the-art production systems that are cost-effective to own and operate, as

System Specifications	
Substrate size	730 x 920 mm
Dimensions (w x d x h)	1930 x 1422 x 2972 mm
Cabinet	Nickel-plated aluminum panels, steel structural tube, adjustable feet
Power	220 VAC, 3-phase, 36 kW
Control	Labview™, 2x DB25
Substrate Temperature	RT -250 ˚C ±3 ˚C
Deposition Uniformity	< 5% (3σ) within plate
Vacuum Pump	Remote, vibration-isolated, compatible with house vacuum
Compatibility	Cleanroom class 100 compatible
Precursor Specifications	
Precursor Delivery System	2 lines standard, metal VCR seals, maximum temperature to 200 ˚C
Valves	High speed pneumatic pulse ALD valves (15 msec) with continuous purge
Precursor Cylinders	Stainless steel 1600 ml (800 ml fill)
Carrier/Venting Gas	Mass flow controlled, 200-2,000 SCCM

Complete Control

The Tahiti is equipped with a built-in, industrial grade touch-screen display that is designed to withstand harsh manufacturing environments. From this single user console, you can control the operation, maintenance, and analysis of both Tahiti chambers.



ALD Thin Film Optical Applications

- Antireflection
- Optical filters
- OLED layers
- Photonic crystals
- Transparent conductors
- Electroluminescence
- Solar cells
- Lasers
- Integrated optics
- UV blocking
- Colored coatings

well as fast and easy to maintain. The Tahiti system is designed for easy network integration into automation-driven large area manufacturing facilities.

- **Automation-ready.** Features such as the ALD-specific pneumatic gate valve, high reliability lift pin mechanism, and built-in sensors allow the system to be operated automatically with no need for operator intervention. On-board diagnostics alert production managers to potential problems and ensure consistent, repeatable results.
- **Low cost of entry and ownership.** Affordable cost of entry achieved by Cambridge NanoTech's simplified system design. Reduced operating costs and easy maintenance are made possible by low precursor and gas consumption, fully integrated ALD Shield vapor trap, and off-the-shelf replacement parts.
- **Four-hour maintenance.** System maintenance, which involves swapping out only three parts — the sealed stainless steel reactor liner, door cover and ALD Shield — can be performed quickly and efficiently after each 10 µm of deposition (400 runs of 25 nm) to maximize uptime and throughput.
- **Built for safety.** The Tahiti has many safety features including industrial hardware and software interlocks, a fully-vented steel cabinet, smoke alarm, accidental precursor drip pan, and multiple EMOs.
- **A complete solution.** Each Tahiti system includes qualified recipes and prepackaged chemistries that have been proven in many thin film applications. Cambridge NanoTech support team provides comprehensive services worldwide, including production and process planning, supplying spare parts and thin film expertise.

ALD Shield

Cambridge NanoTech's integrated ALD Shield is a patent-pending heated honeycomb vapor trap that allows excess reactive vapors to form a film before they reach the pumping system. This eliminates build-up of deposits on the plumbing and in the pump, thereby reducing maintenance costs and preventing excess gases from being exhausted to the environment.

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, Inc. and Sigma-Aldrich, Inc.

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