

ATLANT 3D[®]



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● PRODUCT BROCHURE

NANOFABRICATOR[®] LITE

Our benchtop DALP[®]-enabled platform for scientific R&D.

NANOFABRICATOR™ LITE

NANOFABRICATOR® LITE

Accelerating Material Innovation, Rapid Prototyping, and Device Fabrication at the Atomic Scale.

NANOFABRICATOR® LITE is a compact and versatile material innovation & prototyping platform, designed for scientific R&D.

NANOFABRICATOR® LITE utilizes ATLANT 3D's proprietary Direct Atomic Layer Processing (DALP®) technology, a spatial, lithography-less ALD technology.

NANOFABRICATOR® LITE offers unparalleled flexibility, rapid prototyping, and conformal, multi-material processing, including direct localized atomic layer deposition and etching.



Proprietary DALP® Micronozzle Reactor



- Enables precise atomic-layer deposition and etching for high-fidelity structures
- Delivers controlled, localized multi-material material placement



Maskless, Lithography- Free Fabrication



- No need for shadow masks or multi-step lithography
- Removes key limitations of conventional thin-film processes (no cleanroom needed)



Intuitive, Streamlined Software Workflow



- User-friendly interface with real-time design adjustments
- Simplifies operation and reduces setup time



Compatibility with Industry-Standard Design Files



- Supports GDS-II and DXF file formats
- Allows effortless design, preview, and optimization

TESTIMONIALS

“ This cutting-edge tool plays a pivotal role in advancing our research into next-generation batteries, materials for analog neuromorphic computing, high-power GaN electronics, and active layers for perovskite solar cells, pushing the boundaries of what’s possible in material science and device innovation. ”

Dr. Alexander Kozen, Professor at Department of Physics,
University of Vermont, VT, USA

RESEARCH & APPLICATIONS

Enabling Flexible Nanofabrication for Scientific and Advanced Research Environments.

Processing in ambient, open atmospheric conditions on substrates up to 4”, and offering complete freedom of experimental design, the NANOFABRICATOR® LITE is well suited to scientific and research institutions.

The NANOFABRICATOR® LITE requires minimal start-up training, with an easy-to-use integrated software and control system. In addition, with an exhaust connector and integrated furnace, the small quantity of reactive gases used in depositions are safely removed from the process chamber, making the tool safe for non-cleanroom environments.

“ ATLANT 3D’s direct deposition capabilities have allowed us to overcome the design constraints of lithography, creating novel device designs for electronic devices and sensors, even on complex surfaces. The integration of multiple materials in a single sensor platform has vastly improved our capabilities, making it an invaluable asset in our research. ”

Dr. Boris Hudec, Scientific Researcher at
The Institute of Electrical Engineering, Slovak Academy of Sciences

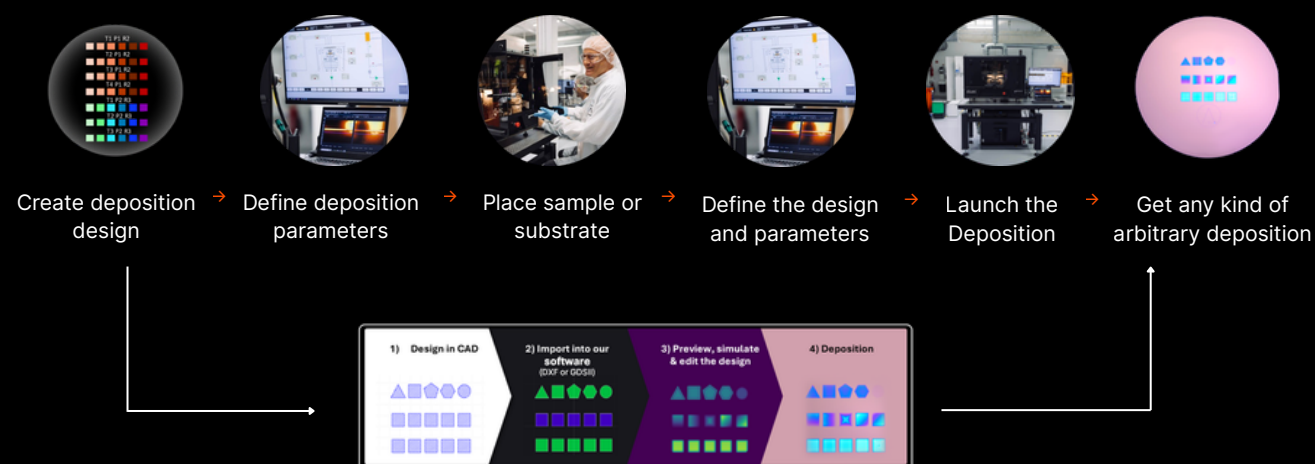
OUR PROPRIETARY TECHNOLOGY

DALP® enables direct, localized atomic-scale material processing by positioning a micronozzle at a controlled working distance above a moving substrate.

ATLANT 3D's proprietary Direct Atomic Layer Processing (DALP®) technology supports precise deposition and etching of multiple materials, reducing reliance on conventional batch-based fabrication workflows and enabling software-defined manufacturing at the atomic scale.

End-to-End Material Workflow

A seamless process from digital design to physical fabrication, enabling rapid iteration and scalable production.



DALP® TECHNOLOGY BENEFITS

Why it Matters

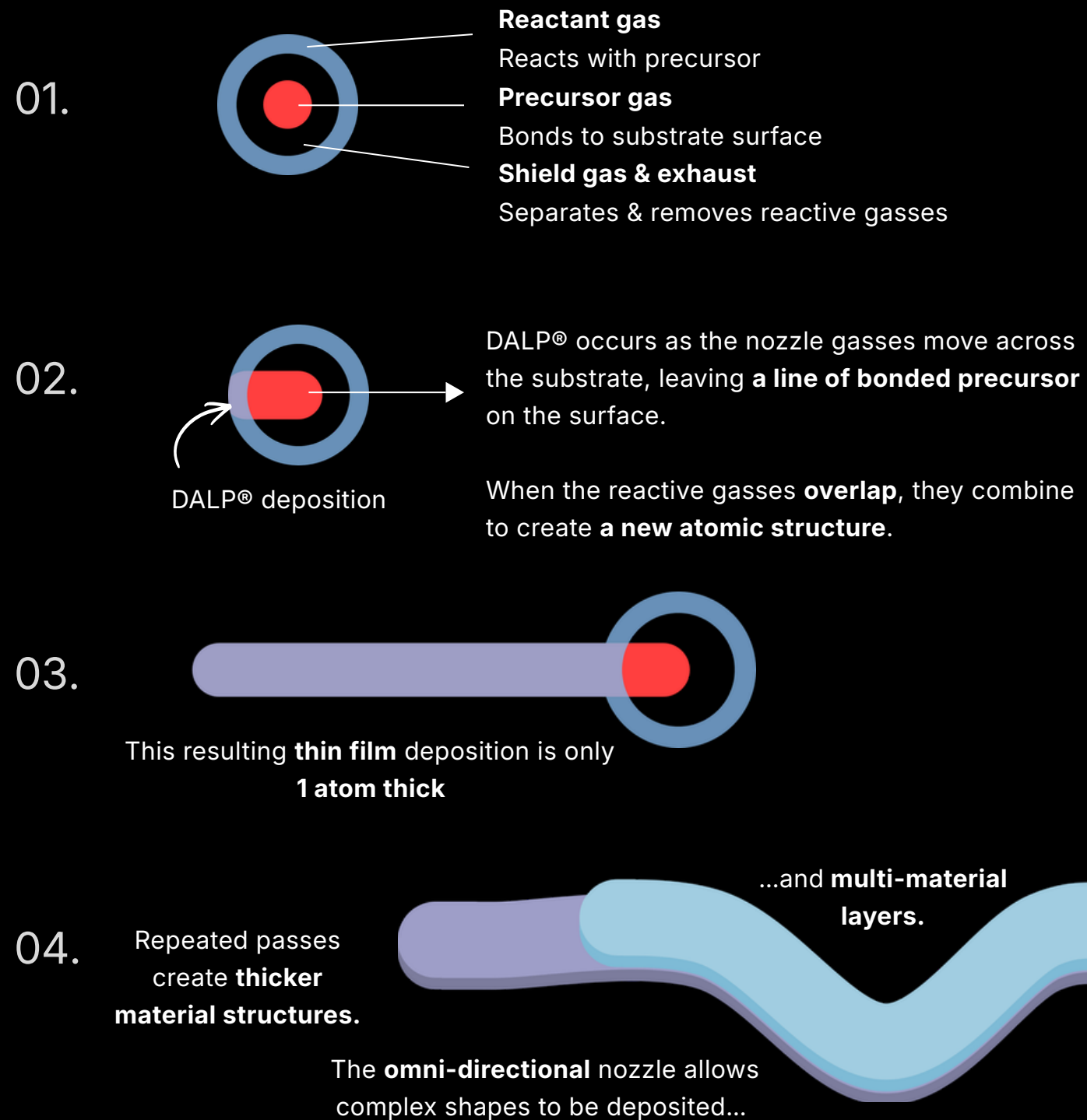
- Accelerates materials innovation **from years to days**
- Accelerates device prototyping and industrial integration
- Enables direct transition **from lab to fab**
- Reduces reliance on complex global supply chains
- Supports more **sustainable** and **localized manufacturing**

Key Advantages

- ✓ Direct-write patterning at micron scale
- ✓ Localized ALD, ALE, and MLD processes
- ✓ No photoresist, masks or etching
- ✓ Multi-material deposition in a single workflow
- ✓ Reduced process steps & tool transfers

HOW IT WORKS

ATLANT 3D's patented micronozzle channels reactive & shield gasses into the pattern shown:

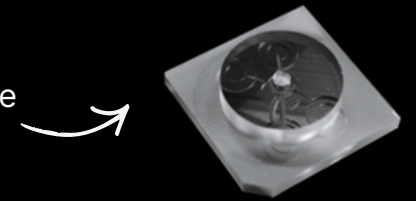


NOZZLES

There are three types of interchangeable quartz nozzles required for tool operation. They can be cleaned for re-use, or purchased as a consumable. We have a dedicated team behind the development of innovative nozzle architectures, meeting the needs of an ever-growing set of applications.

+ DALP® Micronozzle:

Standard line width resolution: 350-400 μm , with finer line width nozzles in development.

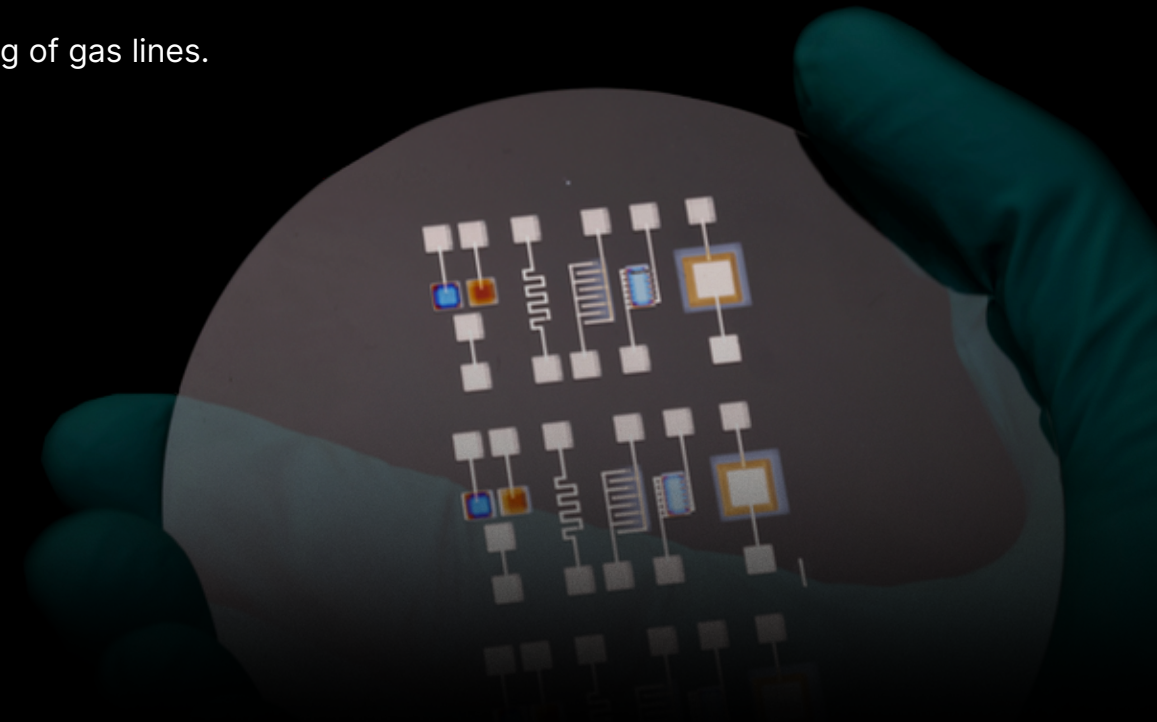


+ BLANK Nozzle:

For capping gas system when not in use.

+ PURGE Nozzle:

For extensive purging of gas lines.



FEATURES

The NANOFABRICATOR® LITE can be configured to support up to six bubblers: three precursors and three reactants, as well as additional gas lines including Ozone.

LITE performs depositions in open atmospheric conditions and is fully inert-capable with an optional inert-chamber upgrade.

Key features:

- Benchtop tool, with a 0.8 x 1.4 meter footprint
- 200mm/s max. processing speed
- Up to 4" (100 mm) substrate size
- Multi-material deposition
- Standard nozzle is 400um line width (micronozzles are interchangeable)



LITE on size, heavy on capabilities

MODULES & UPGRADES

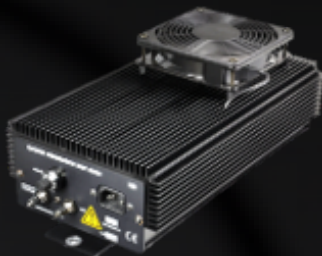
NANOFABRICATOR® LITE can be upgraded with additional bubblers, Ozone generation and inert capabilities.

+ BUBBLERS:	Std.	Upgrade
No. of Precursor Bubblers	2	+1
No. of Reactant Bubbler(s)	1	+2
No. of Reactant Gas line(s)	1	+1



+ OZONE GENERATOR:

The base tool is equipped to accommodate one reactant gas line (O3 / alternate reactant gas).

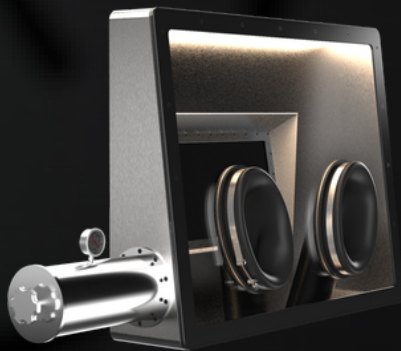


BMT 802N
Ozone Generator

+ INERT MODULE:

The NANOFABRICATOR® LITE Inert Module is an additional upgrade, installed at purchase or retro-fitted on site.

The Inert Module offers a fully controlled and purified inert environment. A loading chamber (antechamber) is manually operated and allows an operator to bring substrates and nozzles into the process. An ergonomic glove box and large viewing window provides internal access without compromising the environment.



Inert module shown without purifier and pump.
Please note that the inert chamber design may vary from the images shown.

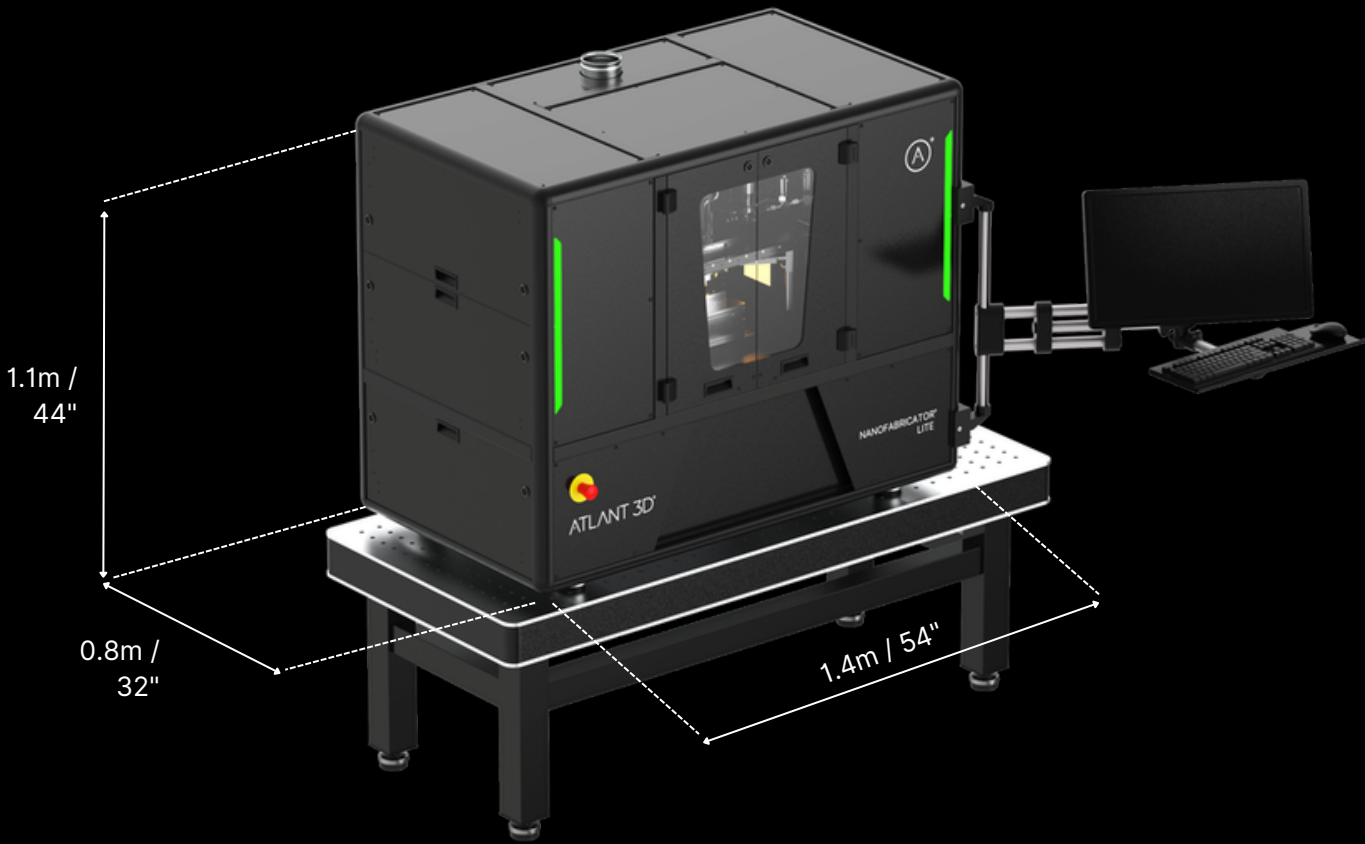
TECHNICAL SPECIFICATIONS

Substrate	Size	1" to 4" wafer. Max. 10 mm thickness
	Holding	Vacuum (triple zone)
	Handling	Manual operator handling
	Heater	Max. 300°C (+- 1%)
Process chamber	Environment	Ambient, uncontrolled
	With inert module (optional upgrade)	Inert (Ar), controlled
Motion control	Deposition speed	Max. 200 mm/second
	Deposition resolution	350-400 µm DALP® resolution
	Deposition volume	100 x 100 x 25 mm (x, y, z) Up to 1.5 mm from substrate edge.
Substrate positioning	Nozzle-substrate gap measurement	Interferometry
	Nozzle-substrate gap verification	Side camera, real-time view
	Sample scanning & positioning	Top camera, real-time view
Gas system	DALP® temperature	Max 150°C
	Bubbler temperature	Max 130°C
	No. Precursor bubblers	2 as standard, Max. 3
	No. Reactant bubbler(s)	1 as standard, Max. 3
	No. Reactant gas line(s) / interface	1 as standard, Max. 2
	Upgrade: Ozone generator	0 as standard, Max. 1
Power	Tool power requirements	208-240 VAC, 50-60 Hz, 30 A

FAQs

- Can the NANOFABRICATOR® LITE be plugged into a 110 V outlet?
The NANOFABRICATOR® is designed for EU/US industrial 208-240 V (single phase). We can advise on transformer installation if only 110 V is available.
- Which substrate size can I use?
The NANOFABRICATOR® LITE is equipped with a square vacuum chuck with concentric circular vacuum zones, accommodating wafers up to 4" (100 mm) in diameter. The chuck has three separate vacuum zones, Ø12 mm, Ø40 mm, and Ø90 mm.
- Do I need additional outlets for the chiller and exhaust gas pump?
The auxiliary chiller and the exhaust gas pump are both connected to the NANOFABRICATOR® LITE for power. Dedicated electrical sockets are located on the back panel of the equipment.

INSTALLATION



1.8 x 0.8 meter table.
Standa Honeycomb Breadboard table,
recommended. Table not included.

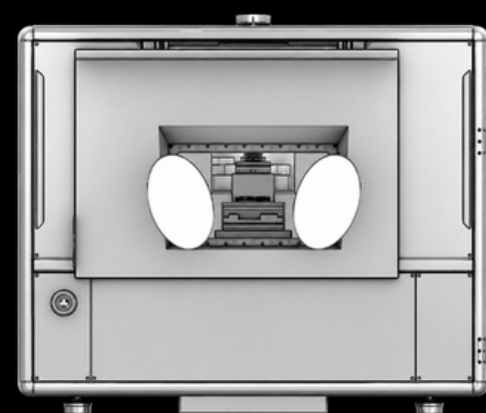


NF LITE approx.:
500 Kg
1100 lb

Power	Facility power supply	DR30 Type 3r Female, (3P+N+G)
Gas	Compressed Dry Air (CDA) - Required	6 bar, for operation of pneumatics in equipment
	Argon Gas - Required	6 bar, 99.9999% purity, carrier gas
	Nitrogen Gas – If applicable	6 bar, 99.9999% purity, process gas
	Oxygen Gas – If applicable	6 bar, 99.9999% purity, gas source for ozone generator
Exhaust	Ventilation of deposition byproducts	100 mm interface diameter, 10 m3/h flow rate

CONFIGURATION FOR INTEGRATION WITH ROBOTICS FOR SELF-DRIVING LABS

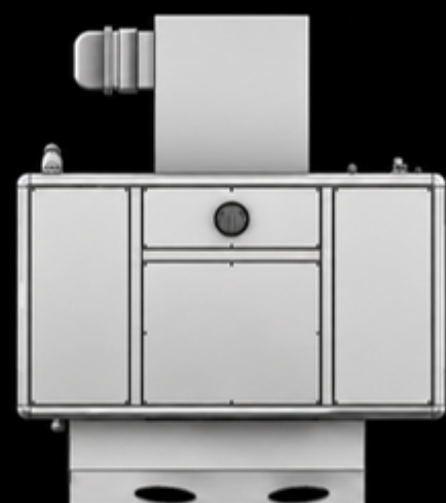
Seamlessly connect NANOFABRICATOR® LITE with robotic platforms to enable autonomous materials discovery and closed-loop experimentation.



Front view

Robotics-Ready Platform Design

Compact configuration supporting integration with automated wafer and sample handling systems.



Top view

Modular System Architecture

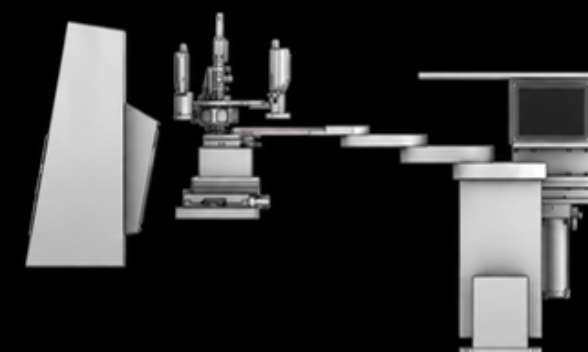
Designed to support integrated wafer handling and operator access in a controlled environment.



Side view

Two-Sided Access

Process chamber access through the rear-face of the tool enables integration with inline processes.



Internal features view

Autonomous R&D Workflows

Integrated wafer handling and cassette loading enable continuous AI-driven experimentation, accelerating materials development in self-driving laboratories.

SOFTWARE

Our NANOFABRICATOR® platforms are operated with the same software, our custom interface for building experimental designs and launching jobs.

There are two software solutions, providing a fully developed suite of tools at different stages of the process: DALP® Designer and DALP® Pilot.

DALP® Designer Software

DALP® Designer is the design and simulation software for preparing device and experimental layouts for DALP® processing. It allows users to:

- Import or draw device and experimental designs
- Assign material recipes
- Set deposition properties
- Generate deposition previews
- Export projects directly to DALP® Pilot

DALP® Designer enables a smooth transition from design to automated deposition.

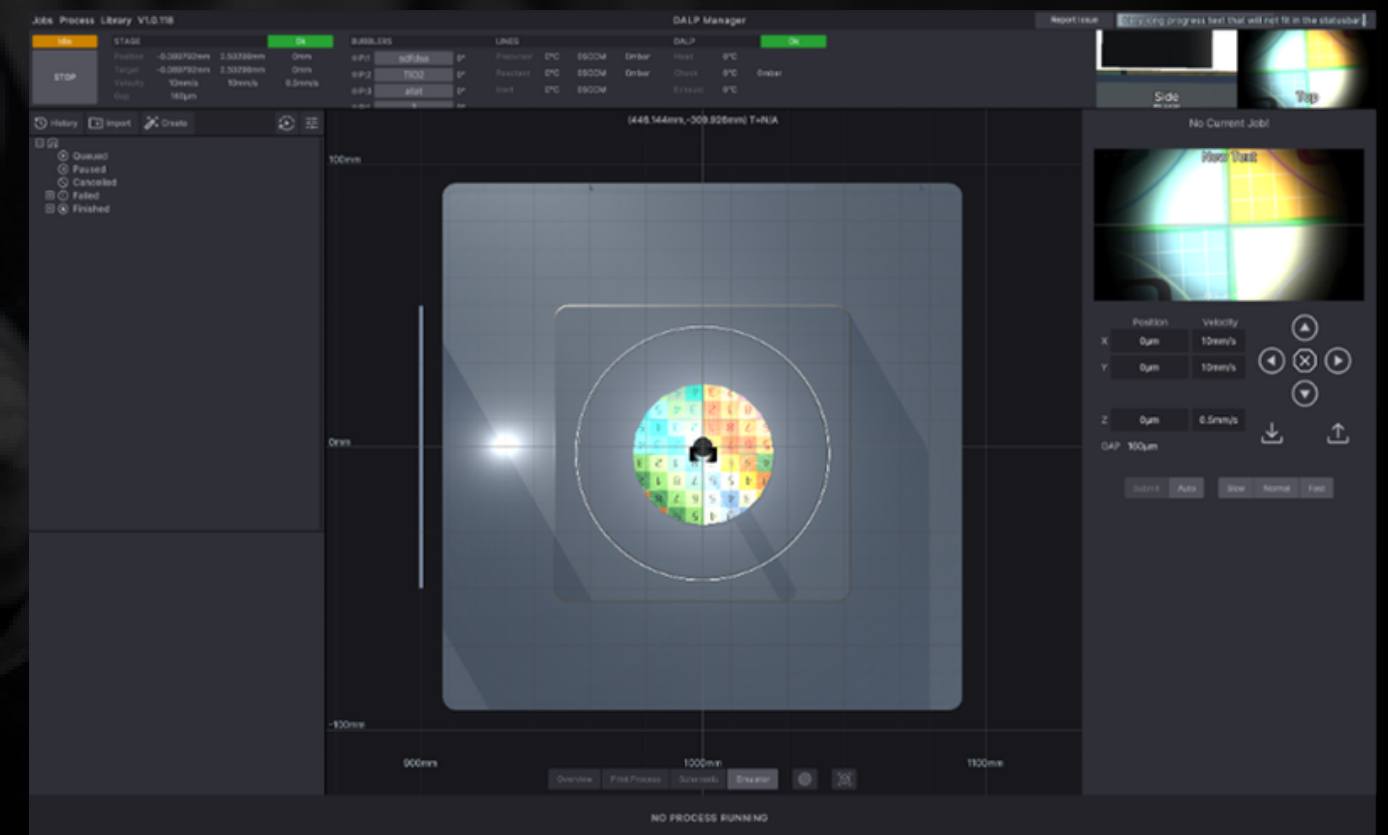


DALP® Pilot Software

DALP® Pilot is the machine control software and allows:

- Automated deposition process with guided instructions
- Scheduling of processing jobs
- Monitoring of vital machine parameters
- Capturing of process telemetry

The DALP® Pilot software can import complete projects from design, including deposition trajectories, metadata for recipe control, and alignment markers.



DALP® Pilot software showing the "virtual" chuck in the middle, the job queue on the left, and the camera view and stage controls on the right. The top of the screen shows selected telemetry values.

START THE CONVERSATION

Let's Explore how NANOFABRICATOR® LITE can Accelerate your Materials, Processes and Applications R&D.



+ Dr. Bonnie Tsim

VP of Commercial Strategy and Partnerships

sales@atlant3d.com

LET'S DISCUSS

- Materials & device research
- Process development & validation
- NANOFABRICATOR® LITE integration
- Pilot projects & strategic partnerships



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