THEIA™

200 mm R&D Platform

ALD^{x} Line

Single Wafer - Research

THEIA integrates proven design and components from the TEPHRA commercial solution into an R&D package, offering exceptional performance, flexibility, reliability, and safety. It allows for field upgrades to meet evolving needs and enables easy transition from R&D to production, with recipes created in THEIA easily sent to TEPHRA for commercial scale production.

12 nm/min

deposition rates

Up to 90%

chemical utilization

< 1%
Non-uniformity

wafer-to-wafer

Materials & Applications

Oxides: Al2O3 , SiO2 , HfO2 , ZrO2 , Ta2O5 , AZO, TiO2 , Y2O3

Nitrides: TiN, TaN, AlN, GaN, ZrN,

Metals: Ru, Pt, Co, Cu, Ni

- ALD precursor development
- Environmental barrier coatings
- Interface and adhesion layers
- Corrosion protection & abrasion resistant coatings
- Area selective chemistry development

FORGE NANO

Global HQ:
12300 Grant Street #110 Thornton, CO 80241
Phone: +1.720.2598579

Specifications & Options

Standard Specifications	
Wafer Sizes	Up to 200 mm
Process Temperature	Up to 500C (chuck); Up to 200C (walls)
Main Dimensions (LxWxH)	80x42x75 in
Precursor Channels	Up to 6
Inert Gas Lines	2
Gas Distribution	Showerhead
Loading	Manual
Compliance	CE & UL508A

Options & Upgrades

Quartz Crystal Microbalance (QCM)
Remote Plasma Source (PE-ALD)
Ozone Generator
Automated Load Lock
Hazardous Gas Enclosure
Heated Precursor Cabinet
Foreline Pump & Activated Carbon Filter
External Chemical Safety Sensors

References & Case Studies

BINGHAMTON UNIVERSITY
STATE UNIVERSITY OF NEW YORK

Professor Tara Dhakal
Center for Autonomous Solar Power

Read the full paper!

- An ultrathin bilayer of ZnO and Al2O3 deposited on 200 mm wafers increased the power conversion efficiency of a perovskite solar cell to 17.5%.
- Oxide thin films were shown to enhance the fill factor and charge extraction of the solar cell.
- Dynamic pressure control and fast pneumatic valving in the tool offered fast cycle times even at low temperatures when thermal budget and surface damage is a concern.

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