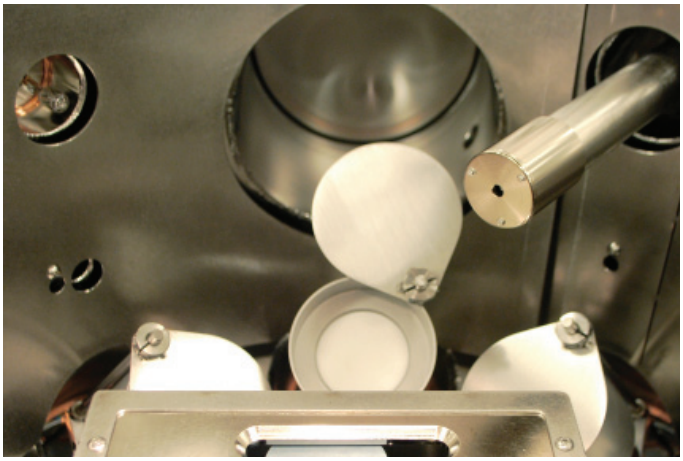
PVD PRODUCTS

PLD/MBE 2100, 2300, 2500

PVD Products **PLD/MBE 2100, 2300, 2500** systems provide a field-proven laser deposition system that allows the end user to deposit films in several modes such as monolayer-by-monolayer, multi-layers, and combinatorial growth modes. The systems include an oxygen-compatible substrate heater that provides actual substrate temperatures of 950°C for silicon and other non-transparent substrates, and 850°C for transparent substrates such as sapphire or LaAlO3, without the need for silver paste. Heating elements are easily field-replaceable. A programmable Z-stage provides variable target-to-substrate distances from 55 to 105 mm.

This system also includes a PVD Products unique Intelligent Window that keeps the optical beam path clean for extended periods of time and provides a mechanism to measure the energy that has entered the deposition chamber. The optical beam path is completely enclosed for safety and includes the ability to raster the laser beam across the 2" diameter target to enhance film uniformity. Laser beam rastering provides excellent film uniformity and target material utilization.

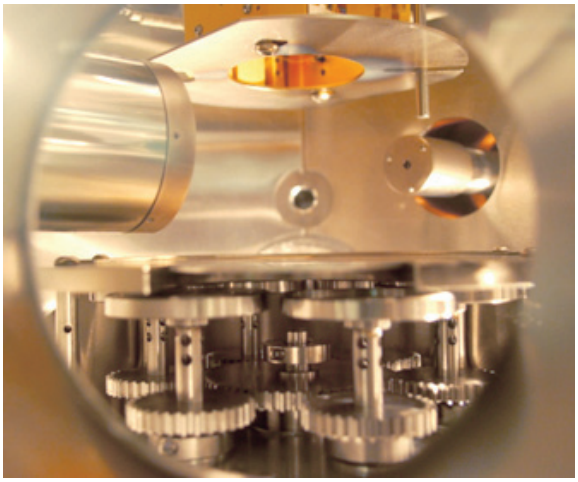


PLD 3000

Shown with optional dual position load lock and a COMPex 200 series excimer laser

PLD/MBE Side Port

View showing Staib RHEED assembly and bottom of heater with sillicon wafer and target pedestals



Ports are provided for a dual-wafer load lock, high-pressure RHEED, optical spectroscopy, substrate and target viewing. The PLD/MBE 2100 provides a single additional port that can be used for either a magnetron sputter source, ion or atom source or effusion cell. The PLD/MBE 2300 provides three ports for the addition of any combination of three magnetron sputter sources, ion or atom sources or effusion cells. The PLD/MBE 2500 provides four ports for the addition of effusion cells or atom source, and one 6" port for the addition of ion source, magnetron or an additional effusion cell.

The systems come equipped with a Pfeiffer HiPace turbo pump (360 L/sec for PLD 2100, 680 L/sec for the PLD 2300 or 2500) backed by an Edwards dry scroll pump. A complete set of vacuum gauges is provided, including a capacitance manometer that, coupled with a VAT Series 64 stepper motor controlled gate valve, provides closed-loop pressure control from 5 to over 500 mTorr. The PLD/MBE 2100, 2300, 2500 can be integrated with a variety of different excimer or other lasers.

Unlike circular PLD chambers, our cylindrical chamber includes modular and removable SS shields for easy cleaning of material buildup on chamber sidewalls.

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PLD/MBE 2100, 2300, 2500

Specifications

Maximum Substrate Size (All Systems)
Can handle 2" diameter or multiple small substrates.

Number of Targets (All Systems)
Six 2" diameter or smaller targets with optional inserts.

Maximum Substrate Temperature (All Systems)
950°C for silicon, **800°C** for transparent substrates. Fully oxygen compatible, programmable Eurotherm controller. No silver paste required.

Base Pressure
< 5 x 10^{-7} Torr standard, < 5 x 10^{-8} Torr with optional dual-wafer load lock, < 5 x 10^{-9} Torr with optional UHV system.

Pumping Package
Pfeiffer HiPace 400 for the PLD/MBE 2100 and a HiPace 700 turbo pump for the 2300 and 2500 units. All backed by an Edwards dry scroll pump VAT PM5 closed-loop pressure controller, Series 64 gate valve, full vacuum gauging with capacitance manometer.

Operating Pressure
Base pressure to ~500 mTorr.

Target to Substrate (Throw) Distance
Programmable from ~55 to 105 mm.

60° Nominal Angle
Of incidence of the laser beam on target, with programmable laser beam rastering.

Laser Wavelength
248 nm standard. Others available on request.

MFCs
Standard MFC calibrated for oxygen at 50 sccm. Additional MFCs optional.

Software Control
Full PVD Products PLD Laser Pro 3 LabVIEW™ interface controlling all system functions, recipe storage and recall, auto pump and vent sequences, pressure/temperature control and full data logging.

Input Power
Power distribution boxes available for all requirements.

System Options

Dual wafer load lock
Additional MFCs
RF bias on substrate holder
Magnetron sputter sources with RF or DC supplies
Atom and ion sources
Effusion cells
Beam attenuation packages

PLD/MBE 2100 Deposition System
With COMPex 200 series laser

PLD/MBE 2300 Deposition System
With COMPex 200 series laser, optional load lock, HP RHEED and two magentron sputter sources

PLD/MBE 2500 Deposition System
Five effusion cells and Staib HP RHEED gun and re-entrant screen

PVD Products

Fueled by creative problem-solving, our team of experienced engineers and technicians is passionate about finding the best solution to your unique deposition system demands. We provide end-to-end support, from design through installation and continuing maintenance.

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