

PLD/MBE-2000 Deposition System



Photograph of a PLD-2000 MBE style deposition system for 2-inch wafers.

PVD Products PLD/MBE-2000 system provides a field proven laser deposition system that allows the end user to deposit films in several modes such as monolayer-by-monolayer, thick multi-layers, and combinatorial mode. The system includes an oxygen compatible SiC substrate heater that provides actual *substrate* temperatures of 950°C for

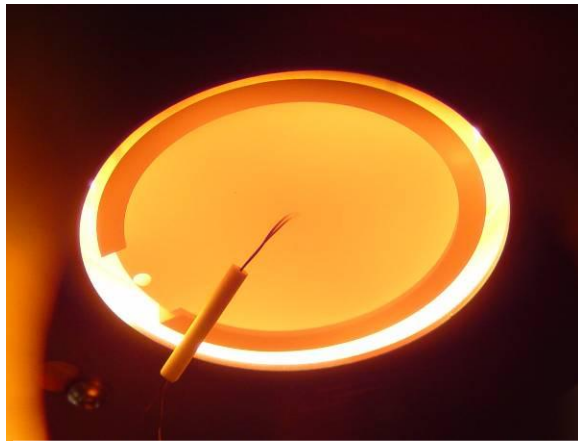
silicon and other non-transparent substrates, and 850°C for transparent substrates such as sapphire or LaAlO_3 without the need for silver paste. A programmable Z-stage provides variable target-to-substrate distances. Ports are provided for a dual wafer loadlock, HP RHEED, optical spectroscopy, substrate and target viewing, and a magnetron



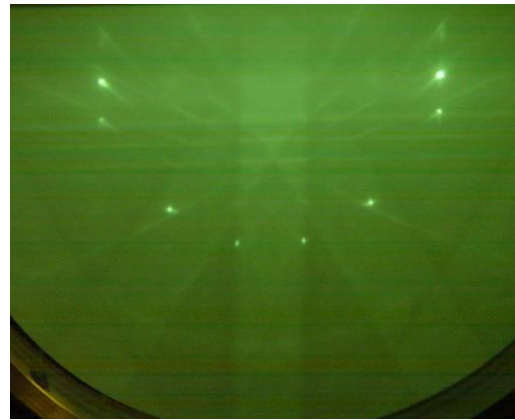


sputter source or effusion cell. This system also includes PVD Products unique Intelligent Window that keeps the optical beam path clean for extended periods of time and provides a mechanism to measure the energy that has entered the deposition chamber. Our optical beam path is completely enclosed for safety and includes the ability to raster the laser beam across the 2-inch diameter target to enhance film uniformity.

The systems come equipped with a Pfeiffer HiPace 300 l/sec turbo pump backed by an Edwards XDS-10 dry scroll pump. A complete set of vacuum gauges is provided, including a capacitance manometer that provides closed-loop pressure control from 1 to over 500 mTorr. The PLD/MBE-2000 can be integrated with all COMPex Excimer lasers



2 inch diameter Inconel disc at 975°C with TC for calibration.



RHEED Pattern at 5 mTorr.

System Specifications:

- Substrate Size:** 2 inch or 3 inch diameter maximum or multiple small substrates (ex. 4 x 1 cm²)
- Number of Targets:** Six (6), 2 inch diameter or smaller with optional inserts
- Maximum Substrate Temperature:** 950°C for silicon, 850°C for transparent substrates (no silver paste required) fully oxygen compatible, programmable Eurotherm controller
- Base Pressure:** < 5 x 10⁻⁷ Torr Standard, <5 x 10⁻⁸ Torr with optional dual wafer loadlock, < 5 x 10⁻⁹ Torr with optional internal bake out system
- Pumping Package:** Pfeiffer HiPace turbo pump/Edwards dry scroll pump/VAT PM5 closed loop pressure controller, Series 64 gate valve, full vacuum gauging included capacitance manometer
- Operating Pressure:** Base pressure to ~ 500 mTorr
- Target to Substrate Distance:** Programmable from ~ 55 to 105 mm
- Laser Beam Angle of Incidence on Target:** 60° with programmable laser beam rastering
- Laser Wavelength:** 248-nm standard, others available on request
- Compatible Lasers:** All Coherent COMPex and LPX lasers, other lasers available on request
- MFCs:** Standard one (1) calibrated for oxygen @ 20 sccm, additional MFCs optional
- Spare Ports:** HP RHEED, sputter source, target/substrate viewports, emission spectroscopy, etc.
- Software Control:** Full LabVIEW interface with control over all system functions, recipe storage and recall, auto pump and vent sequences, pressure, temperature control, and data logging
- Input Power:** Power Distribution boxes available for all customer requirements

