PLD/MBE-2100 Deposition System

Photograph of a PLD-2100 MBE style deposition system for 2-inch wafers.

PVD Products PLD/MBE-2100 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

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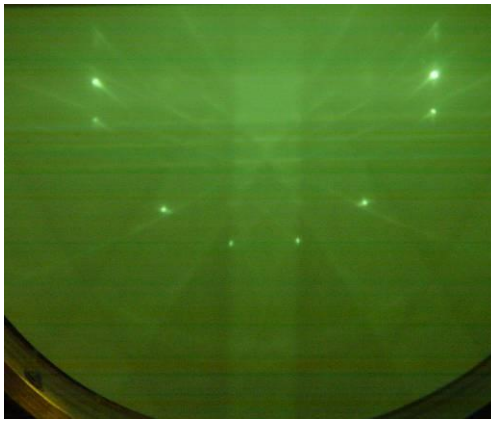
RHEED, optical spectroscopy, substrate and target viewing, and a magnetron sputter source or effusion cell. This system also includes PVD Products unique Intelligent Window that keeps the optical beam path clean for extended periods of time and provides a mechanism to measure the energy that has entered 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-2100 can be integrated with all COMPex Excimer lasers

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



RHEED Pattern at 150 mTorr.

System Specifications:

Substrate Size: 2 inch or 3 inch diameter maximum or multiple small substrates (ex. 4 x 1 cm^2)
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 $x10^{-7}$ 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

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PLD/MBE-2300 Deposition System

Photograph of a PLD-2300 MBE deposition system for 2-inch wafers.

PVD Products PLD/MBE-2300 system provides 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 mode. The system includes 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 $LaAlO_3$ without the need for silver paste. A large 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 three ports for the addition of magnetron sputter sources, ion or atom sources or effusion cells. 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 700 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-2300 can be integrated with all COMPex Excimer lasers

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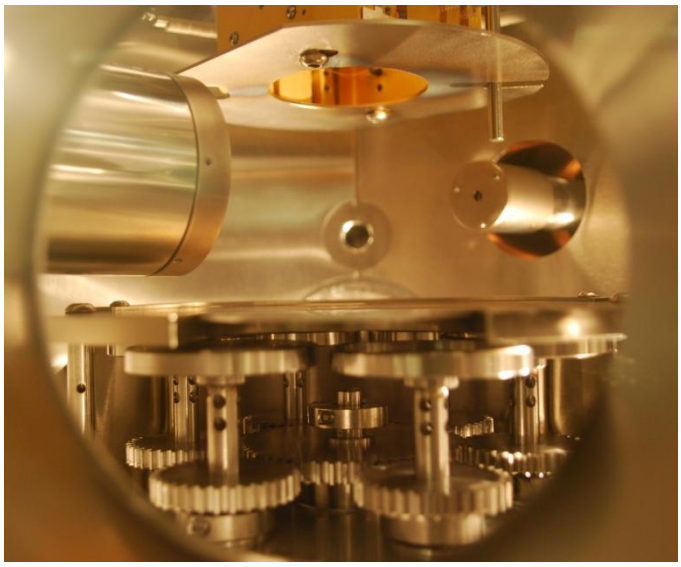
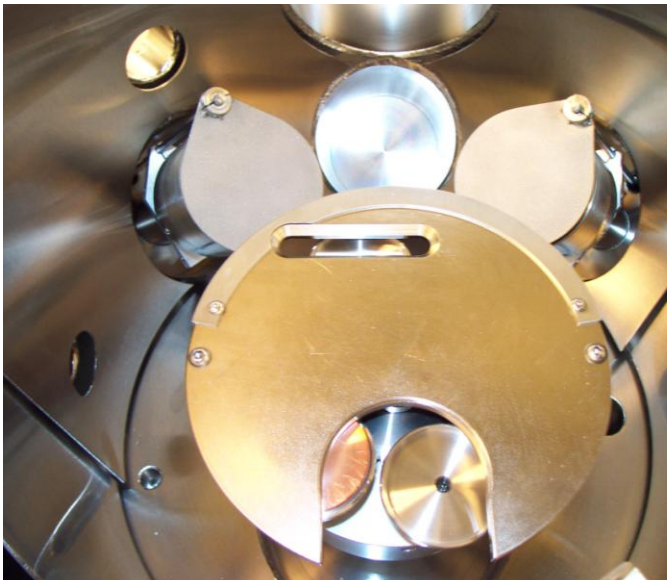


View through PLD/MBE side port showing target manipulator, Staib RHEED assembly and bottom of heater with Silicon wafer



Inside a PLD/MBE 2300 with two 2-inch UHV magnetron sources and six position target manipulator assembly with water-cooled cover plate.

System Specifications:

Substrate Size: 2 inch diameter maximum or multiple small substrates (ex. 4 x 1 cm^2)
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 x10^{-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 700 l/sec 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 @ 50 sccm, additional MFCs optional
Spare Ports: HP RHEED, target/substrate viewports, emission spectroscopy, etc. Three 6.75" CF ports for UHV magnetron sputter sources, ion or atom sources, and/or effusion cells.
Software Control: Full LAB VIEW™ 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

See the PLD/MBE Systems on http://www.youtube.com/user/PVDProducts

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PLD/MBE-2500 Deposition System

Photograph of a PLD-2500 MBE deposition system for 2-inch wafers.

PVD Products PLD/MBE-2500 system provides 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 mode. The system includes 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 $LaAlO_3$ without the need for silver paste. A large 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 four ports for the addition of effusion cells, and one 6" port for the addition of ion or atom sources or an additional 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 700 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-2500 can be integrated with all COMPex Excimer lasers

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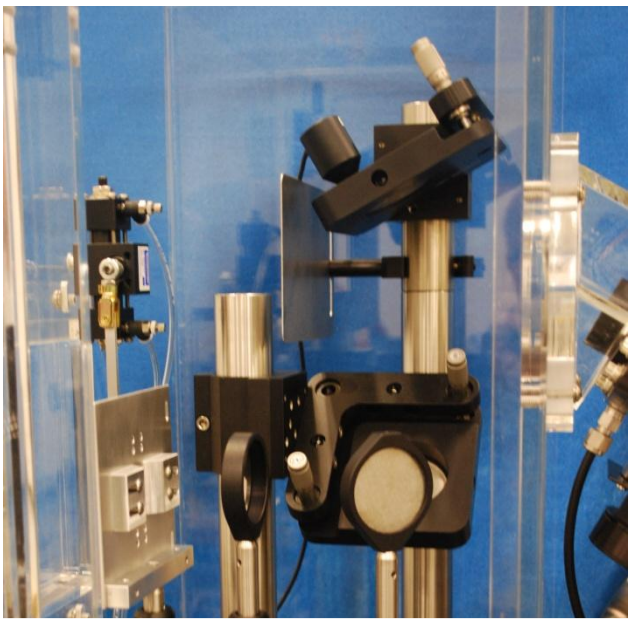
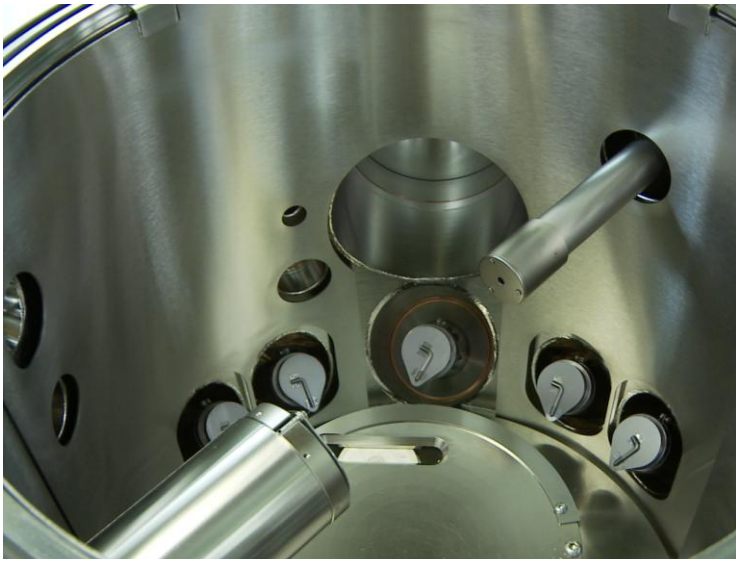


PLD/MBE optical train with adjustable apertures, laser scanner on kinematic mount, pneumatic shutter assembly for laser, in laser safe enclosure.



Inside a PLD/MBE 2500 with five effusion cells and Staib HP RHEED gun and re-entrant screen.

System Specifications:

Substrate Size: 2 inch diameter maximum or multiple small substrates (ex. 4 x 1 cm^2)
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 x10^{-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 700 l/sec 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 @ 50 sccm, additional MFCs optional
Spare Ports: HP RHEED, target/substrate viewports, emission spectroscopy, etc. Four 4.5" CF ports for effusion cells and one 6" CF port for UHV magnetron sputter sources, ion or atom sources or effusion cell.
Software Control: Full LAB VIEW™ 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

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