PLD 2000, 3000

PVD Products **PLD 2000, 3000** systems are capable of depositing high-quality uniform films on substrates up to 2" or 3" in diameter, respectively. Our systems use a 304L SS box style chamber with front-mounted hinged door, providing quick access for easy substrate and target changes. The chamber has multiple user accessory ports for target and substrate viewing, a magnetron or ion source and spectroscopy.

A blackbody-style oven with a bank of IR heat lamps is used for substrate heating. Transparent substrates such as sapphire, LaAlO3 and MgO can be heated to 850°C without the use of a thermal bonding agent or clamping. Silicon and other absorbing substrates may be heated to 950°C. Temperature uniformity of ±3°C is readily achievable over 3" diameter substrates. The heater is surrounded by a water-cooled housing that keeps the chamber walls, targets and gears cool during deposition. Heating elements are easily field-replaceable.

The PLD 2000 system includes four 3" diameter targets, and the PLD 3000 system includes three 4" diameter targets. Large-diameter targets, coupled with laser beam rastering, provide excellent film uniformity and target material utilization. Constant target resurfacing is not required.

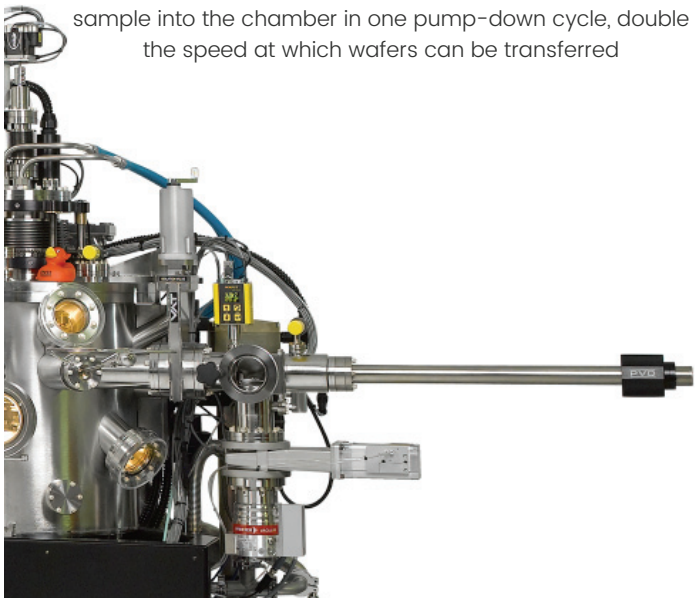


PLD 3000

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

PLD 2000 Dual-Wafer Load Lock Assembly

This load lock allows for the removal and insertion of a sample into the chamber in one pump-down cycle, double the speed at which wafers can be transferred



A complete enclosed optical train that rasters the laser beam over the desired large-diameter rotating target is included. The optical train also utilizes our Intelligent Window with in-chamber energy monitoring. Complete vacuum gauging along with a 480 L/sec turbo pump is provided to achieve pressures below 5 X 10^{-7} Torr.

All electropneumatic valves are controlled via computer. Constant pressure is achieved by using an MFC, capacitance manometer and closed-loop stepper motor-controlled gate valve. This system is ideal for materials and device research or prototype production.

Our systems come with a current-model computer and PVD Products PLD Pro 3 LabVIEW™ software to control the entire system. Thin film recipes can be created, recalled, modified and stored. The system includes full data logging of all relevant deposition parameters.

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PLD 2000, 3000

Specifications

Maximum Substrate Size
PLD 2000: Can handle one 2" wafer or multiple smaller samples per customer requirement.

PLD 3000: Can handle one 3", one 2", or multiple small substrates per customer requirement.

Maximum Substrate Temperature
950°C (in oxygen) for non-transparent substrates (such as silicon) and **850°C** for transparent substrates (such as LaAlO3). No thermal paste or bonding required.

Temperature Uniformity
± 3°C across 3" diameter Si substrate.

Operating Pressure Range
5 x 10^{-7} Torr base to 300 mTorr.

Target Size
PLD 2000: Includes four 3" diameter targets.
PLD 3000: Includes three 4" diameter targets (easily adaptable to other sizes).

Film Thickness Uniformity
± 5% over 90% of a 3" diameter substrate for 500 nm thick film using 4" diameter target.

Target to Substrate (Throw) Distance
Variable from ~75 to 125 mm (may affect maximum temperature, temperature uniformity and thickness).

60° Nominal Angle
Of incidence of the laser beam on target.

Base Pressure of the Main Chamber
P < 5 x 10^{-7} Torr guaranteed, with system at room temperature without targets in the chamber.

Base Pressure with Load Lock
P < 5 x 10^{-8} Torr guaranteed, with system at room temperature without targets in the chamber. UHV available.

Operational Wavelength
248 nm (KrF) or 193 nm (ArF).

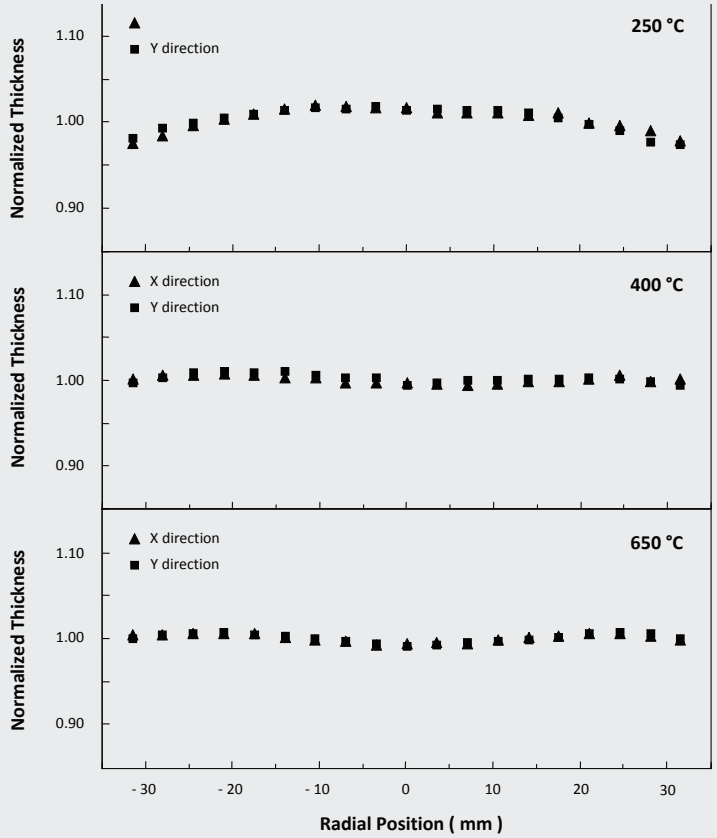
System Options

Load locks for fast turnaround time and improved main chamber base pressure

Additional MFCs

Custom substrate holders

PLD 3000 Thickness Uniformity



Normalized film thickness from three Ta2O5 films deposited onto a 3" silicon substrate at:
a) 250°C
b) 400°C
c) 650°C

Reference
Boughaba et. al. Mater. Res. Soc Proc., Vol: 567, 527

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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