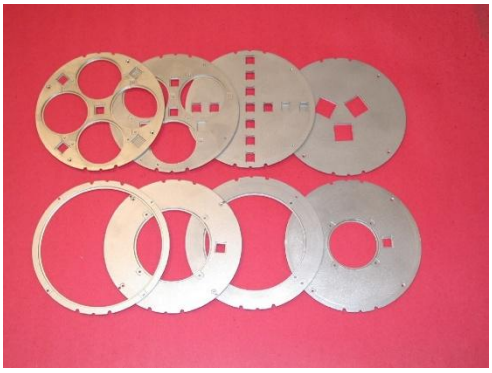
PVD Products PLD-4000/5000

PVD Products Turn-Key PLD-4000 and 5000 are field proven systems capable of depositing high quality, uniform films on substrates up to 4” (100 mm) and 5” (125-mm) in diameter, respectively. Our systems use a box style chamber with a large, front-mounted, hinged door to quick and easy access for substrate and target changes. The chamber includes multiple user accessory ports for target and substrate viewing, as well as for spectroscopy. A unique blackbody style oven is used for substrate heating. These systems are ideal for relatively large area deposition for device related research or prototype production. Large transparent substrates such as sapphire, $LaAlO_3$, and MgO can be heated to 850°C without the use of a thermal bonding agent (such as silver paste) or clamping. Silicon or other absorbing substrates may be heated to 950°C. Temperature uniformity of ±3° is readily achievable over 5” diameter substrates. The heater box is surrounded by a water-cooled housing to keep the chamber walls cool during deposition. Our systems include an laser-safe constant-fluence optical train which rasters the laser beam over the desired large diameter rotating ablation target. The optical train also includes our Intelligent Window which keeps the beam path clean for extended periods of time with in-the-chamber energy monitoring. Pedestals for three or four large diameter targets are included along with motor driven target indexing. Base pressures below 5 X 10^{-7} Torr are readily achievable with a 700 L/sec turbo and dry scroll pumping package. Systems include complete vacuum gauging, pneumatic valves, downstream closed-loop pressure control and appropriate excimer laser packages. Includes complete Lab View™ computer control of all deposition functions including storing and recallnig process recipes. Full data logging of all relevant parameters is also provided.

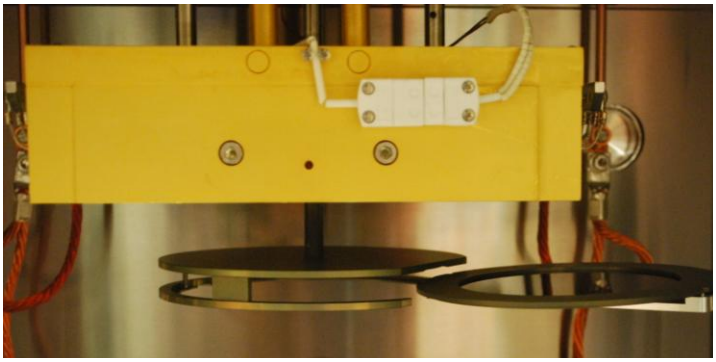
PVD Products, Inc. 35 Upton Drive, Wilmington, MA 01887
Phone: 978-694-9455 www.pvdproducts.com Fax: 978-694-9477

PLD-4000/5000 System Specifications:

Maximum substrate size : **PLD 4000**: Can handle One (1) 4-inch, or one 3-inch, or one 2-inch diameter substrate, or multiple small substrates per customer requirement. **PLD-5000**: Can handle One (1) 5-inch, or one 4-inch, or one 3-inch diameter substrate, or three (3) or four (4) 2-inch diameter substrates, 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 $LaAlO_3$). *No thermal paste or bonding required.*
Temperature uniformity: ± 3°C across 5-inch diameter Si substrate
Operating Pressure Range: 5 x 10^{-4} Torr base to 300 mTorr
Target Size: Four 4-inch diameter targets (easily adaptable to other sizes)
Film Thickness Uniformity: ± 5 % over 90% of a 5" diameter substrate (6-inch throw) for 500 nm thick film using 4" diameter target.
Target to Substrate (Throw) Distance: Variable from 4.5" to 6"(may affect maximum temperature, temperature uniformity, and thickness)
Raster path length: ~3.8 inches
Nominal Angle of incidence of the laser beam on target: 60°
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 Option Available
Operational Wavelength: 248 nm (KrF) or 193 nm (ArF) others available on request.
PVD Products recommends a minimum of a 30 watt excimer laser for these systems.



Various Substrate Holders



Wafer Transfer via Optional Loadlock

System Options:

Load locks for fast turnaround time and improved main chamber base pressure.
UHV Bake Out for pressure below 7 x 10^{-9} Torr
Ion source for IBAD processing, magnetron sputter source.
Additional MFC's
Custom Substrate Holders

Note: Specifications subject to change.

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