Diode Laser Substrate Heater

PVD Products provides customized diode laser heaters to fit your specific substrate heating needs. Laser heating provides high substrate temperatures for small substrates (up to ~37 mm diameter) with a minimum of out gassing in the chamber. Such heaters can work in any background gas including O₂, NH₃, etc. without any problems. These heaters are ideal for localized heating in UHV applications such as MBE and PLD systems.

PVD Products provides turnkey fiber-coupled heaters based on robust laser diode technology. Custom optical trains can be integrated to provide the correct or variable spot size for your specific chamber requirements. Coupled with a fiber optic pyrometer our systems can provide accurate closed-loop temperature control for you most demanding substrate heating needs.

Using our unique susceptor technology, high substrate temperatures can be achieved without the need for substrate bonding to a back plate for most substrate materials. This provides clean vacuum and clean substrates.

25-mm diam. Inconel Block heated in O₂ to 850°C by a 150-Watt Laser Heater. The bright spot on the top surface has a temperature of 1,200°C.

Laser Heater Features

- Multiple configurations - all UHV compatible
- Heating to above 1,200°C for non-transparent substrates, and to ~1,000°C for transparent substrates such as sapphire
- Laser Diode packages providing power levels from 25 to 250 Watts. 808-nm radiation
- Red Laser Pointer Option for beam alignment
- Dual output options (for multiple chambers)
- Closed-loop fiber coupled feedback control
- Compatible with substrate rotation and substrate transfer for loadlocked systems
- Customized brackets and input windows to integrate into your vacuum chamber
- Rack mounted Temperature control module
- Rack mounted Diode Laser Power supply
- Software controllable, providing multiple ramp, dwell functions.
- Uniform substrate temperature profiles due to “flat-top” diode out-put
Photo of 100-Watt Rack Mounted Fiber Coupled Diode Laser System

**Customized Configurations:**

Customized configurations are readily available on request.

**Please provide the following Information:**

1) Maximum substrate size
2) Substrate material
3) Maximum substrate temperature
4) Background gasses
5) Working distance (viewport to substrate distance)
6) Chamber flange size,
7) Fiber optic cable length
8) Mounting bracket Details

**System Options**

1) Diode Laser Pointer
2) Dual chamber outputs
3) Variable Spot Size
4) Variable Working Distances
5) Rotating Substrate Assemblies

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PVD Produts, Inc. reserves the right to change specifications without notice.