

CORPORATE PROFILE

Custom Designs, Superior Service



About NBM Design

Since 2002, NBM Design has been a leader in the design and manufacturing of Pulsed Laser Deposition systems for material scientists and process engineers. At NBM Design, our mission is to provide our customers with the best, most customized, systems to meet their individual needs.

We employ engineers and technicians with extensive experience designing and building vacuum tools for semiconductor and related industries. We believe that simplicity and modularity are the keys to keeping a research system flexible and preventing early obsolescence. This straightforward concept allows our PLD RHEED systems to remain robust, yet inexpensive.

Planned Quality

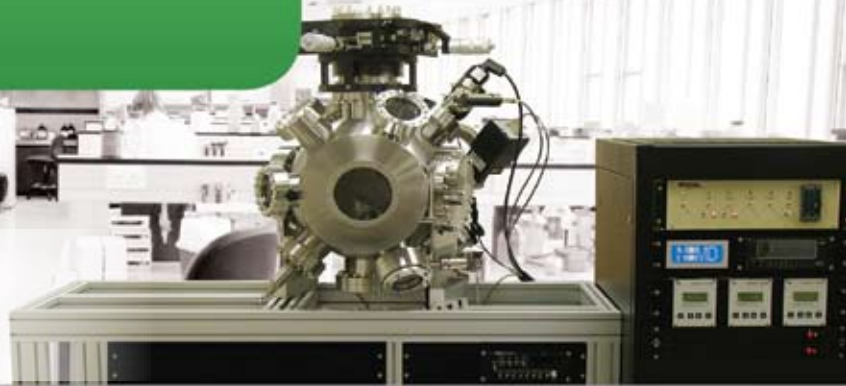
At NBM Design, we firmly believe that planned quality checks are essential in producing first rate products. We believe in continuous testing and improvement throughout the design and manufacturing process. To facilitate this, we have implemented a full documentation control system, serialized part numbers, and unique BOMs for each customer.



Phone: 866-638-7720 | Fax: 410-638-0234
E-mail: contact@nbmdesign.com
Web: <http://www.nbmdesign.com>

FULLY-INTEGRATED PLD SYSTEMS

Versatile Systems For Our Customers



Pulsed Laser Deposition

PLD is a thin film deposition technique that is used to deposit materials onto substrates with very little setup involved. Typical components of a PLD system include a target manipulator, substrate heater, and vacuum chamber. The engineers at NBM Design look at each detail from the customer perspective and manipulate the design to produce a user friendly system. The individual components of each system are designed with versatility in mind and can be configured to meet any system geometry.

Reflection High Energy Electron Diffraction

RHEED systems can be implemented alongside PLD systems for deposition monitoring. Typically performed at very low pressures, RHEED can be performed at PLD-optimal high pressures using a differentially pumped electron source.

At NBM Design, we work with customers to create a custom system that integrates RHEED components with the pumping stacks, support structures, and installation services required to meet specific needs.

Our fully-integrated PLD RHEED systems include:

- ✓ Multiple target selection with individual control of target dynamics.
- ✓ Flexible chamber design with full accessibility to internal components.
- ✓ 1200°C rotating substrate heater with in-situ X, Y, and Z adjustability.
- ✓ Differentially pumped RHEED system with complete software analysis package.
- ✓ Optional load lock can be added to transfer the targets or the substrates without breaking vacuum in the main chamber.

We can also provide our customers with a complete lab setup and any additional accessories that may be necessary.

INNOVATIVE SYSTEM COMPONENTS

Industry-Leading Technology and Design

NBM Design has been an international leader in the design and manufacturing of standard and custom laser deposition systems since 2002. Our mission is to provide material scientists and process engineers with the most rugged and stable vacuum systems available on the market. This, combined with our overall commitment to quality, is just one of the many reasons that NBM Design is considered a primary vendor for Pulsed Laser Deposition systems.

Custom System Components

Target Manipulators

We offer many target manipulator configurations which have single or multiple targets and simple rotation to laser-synchronized movement via our Recipe Builder. Each of our targets is secured in a spring-loaded holder that allows the target to be resurfaced and mounted in the same position without further position verification. A cross-deposition shield is included in most of the configurations to help avoid deposition from neighboring materials.

Substrate Heaters

Rotating Substrate Heaters have been our specialty since we began delivering PLD systems. Like our target manipulators, our heaters are constructed using high-quality components for very reliable service. The maximum temperature that the heater can reach is 1200°C, the highest available for use in oxygen. A load-lock can be integrated into the system to allow for sample transfer without breaking vacuum and the modular design of our heaters enables specific customizations to meet certain requirements and allow for easy integration with load-lock equipment.

Custom Chambers

One of our core competencies is developing flexible systems that are designed to meet current and future goals. The design process includes discussions about potential uses that may affect the system geometry, or strategically placing access ports for future add-ons.

CUSTOM ENGINEERED SOLUTIONS



Unique **Systems** to Fit Your **Needs**

Meeting our customer's requirement has been a crucial aspect of our business. For most of our customers, our pre-designed options fit well within these requirements. In those instances when our standard offering does not meet the required specification, we have the experience and ingenuity needed to engineer a solution that will.

Systems

At NBM Design, our engineers and technicians will work with you to create a custom deposition system to suit your particular needs. We offer a variety of process and technology combinations and we will help you to identify future add-on components that may have an effect on the system geometry. Identifying these potential upgrades will result in a system designed to meet your immediate and future needs.

Custom Stages

NBM Design can create custom stages that can be used in either commercial or research environments and our custom staging apparatus can help extend the life of an otherwise obsolete system. We have built stand-alone and combination stages featuring heating, cooling, rotation, biasing, and various movements to meet specific customer functionality needs.

Automation

NBM Design's products are built specifically for use in commercial and research and development applications that require rugged, stand-alone, field-deployed systems. We also offer control packages to automate laser, target, and substrate actions that include hardware and software bundles to allow for customization of the deposition process.

Clean Area

Cleanliness and low particulate count are essential to establishing a successful thin-film fabrication and processing lab. At NBM Design, we utilize a framing system that allows us to create soft-wall clean areas that minimize airborne particulates without incurring the high cost of building a full clean room. Our unique framing system also allows for changes to be made to existing configurations for optimum lighting and HEPA unit placement.

Engineering

The NBM Design engineering staff is available to consult with you on all design and development issues. We have worked with our customers to shift the burden of overseeing project details to us and have assisted them on software development, mechanical drafting, non-conventional prototype assemblies, and project management.