WaveFront The Quarterly Newsletter of ASML Optics

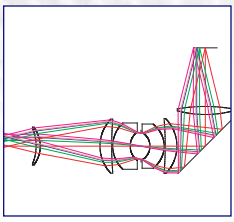
January 2005

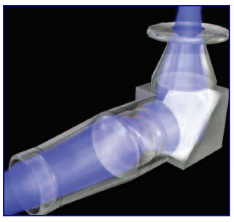
Design-to-Image™ Solutions Meet Demanding Objective's Objectives

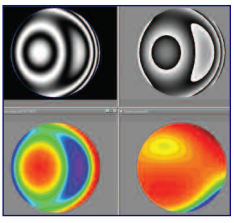
A recent client request challenged the engineers and designers at ASML Optics to create a High NA Objective with a list of stringent requirements few facilities could match. Rising to the test, ASML Optics employed optical design capabilities that included full tolerance analysis, manufacturing and assembly sensitivity analysis, and mechanical cell design, as well as complete optical fabrication. Calculated to pass stringent thermal and shock requirements, the objective was designed, fully assembled and tested on custom-built metrology equipment in less then 6 months with complete success.

This assignment illustrates our Design-to-Image capability in action, and demonstrates what makes ASML Optics such a unique precision optics manufacturer. Our staff of dedicated scientists and technicians combines a rare set of skills, knowledge and experience to undertake an optic solution from initial concept to finished product. No other optical manufacturer offers the same depth and breadth of capabilities. Our specialists can work from no more than a starting set of requirements to design, model, simulate, assemble and test virtually any optic, from large diameter refractive and reflective aspheric optics to flats, windows and spherical lenses and mirrors. System integration is an area of special expertise that ensures smooth and reliable application.

Which is what happened when we implemented this High NA Objective. In this case as in all others, our complete Design-to-Image Solutions allowed our customer to tap into one of the world's most advanced manufacturing operations for extreme-precision optical design, fabrication, and full system engineering and integration. Whether you need new components or entire new systems, you can rely on ASML Optics to engineer and manufacture all or part of your optical system no matter how complex or specialized.







Extreme Precision Optics

ASML Optics, a supplier of extreme-precision optics, provides complete Design-to-Image™ solutions and distinct customer benefits with Asphere Advantage™ technology and PerfectWave™ metrology.

Upcoming Events

Photonics West 2005
January 25-27, 2005
San Jose Convention Center and Parkside Hall
San Jose, California

SPIE Defense & Security Symposium
March 29-31, 2005
Gaylord Palms Resort & Convention Center
Orlando, Florida

Optifab
May 3-5, 2005
Rochester Riverside Convention Center
Rochester, New York

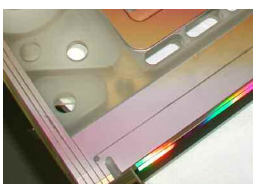
Contact Us

Thomas Fahey
Wilton, CT
203.761.4171
tom.fahey@asml.com

Dan Bajuk
Richmond, CA
510.222.2310
dan.bajuk@asml.com

Mark Bigelow
Tempe, AZ
480.383.4475
mark.bigelow@asml.com

www.asml.com/optics



Example of TWINSCAN reticle chuck completed and after thin film conductive coating.

ASML Optics Extends Capabilities to Precision Glass Structure Fabrication

In the world of optical fabrication, not all components are lenses or mirrors that focus light to an image. In some cases, non-imaging optics called Precision Glass Structures simply direct energy to a point or location where the energy is absorbed or reflected by another object. ASML Optics has recently extended its capability in precision glass manufacturing in several key areas.

Glass is often preferred in semiconductor equipment because of its cleanliness. Additionally, its compatibility with a wide variety of substrate materials makes it ideal for wafer and reticle chucks. ASML Optics is manufacturing parts up to 0.75 meters in size using three-, four- and five-axis grinding and ultrasonic machining equipment that is computer numerically controlled (CNC). We're also successfully manufacturing advanced reticle stage chucks for ASML to become a qualified second source supplier for this critical part of its TWINSCAN dual-stage system. This complex precision glass structure requires several unique glass fabrication processes.

It starts as a monolithic block of Zerodur™, which must be first polished flat to very exacting specifications and then machined, precision-cored, and coated with conductive thin films. We use a precision ultrasonic glass-machining center that converts a mechanical motion into an oscillation. The cutting tool head vibrates at 20KHz and removes micro particles from the work piece surface. This new high tech machine is capable of machining a wide range of advanced materials, from glass, ceramics, and silicon, to carbide, hardened steel, sapphire, ruby---even mother of pearl. Once the primary machining operations are complete, the reticle chuck must be cleaned and stressed-relieved. Then it receives critical multi-layer thin film coatings and has optical gratings bonded to it.

With this extension in capability and process, ASML Optics expects Precision Glass Structures to become a significant part of our business. This capability combined with our Class 100 clean room assembly capability give us another unique competitive advantage in providing extreme precision optics. If you have needs for Precision Glass Structures in your world of work, contact us at www.asml.com/optics.

Zerodur™ is a trademark of Schott.

Catch the PerfectWave™ at Photonics West

You won't want to miss ASML Optics at Photonics West, January 25-27, in San Jose, CA. where we will highlight our PerfectWave™ metrology products. Mark Bigelow, VP Sales, will be presenting *Optical Metrology Enhancement with PerfectWave Calibration Standards*, which demonstrates that accurate interferometric metrology is the cornerstone of precision optical fabrication. Discover how ASML Optics PerfectWave Calibration standards provide a means to extend the accuracy of optical metrology beyond λ/100 PV. Join us on Wednesday, January 26 at 3:30pm in Hall 3, San Jose Convention Center.

Watch for our new PerfectWave ad debuting in the February issues of *Laser Focus World* and *OE Magazine*. And be sure to visit our booth 527 at Photonics West to get your complimentary copy of the ASML Optics 2005 calendar.