Advanced Optical Component Testing

Provides cutting-edge measurements for broad range of laser-induced materials changes

LLNL's Isotope Separation and Advanced Manufacturing (ISAM) Technologies program has developed unique resources and capabilities for testing optics, particularly for testing absorption and damage characteristics caused by high-average-power laser beams. Our capabilities are the result of highly skilled personnel, state-of-the-art instrumentation, tight environmental control, and specialized testing procedures. Testing is done in a Class-1000 clean-room, with temperature control to one half degree.

Full range of testing available

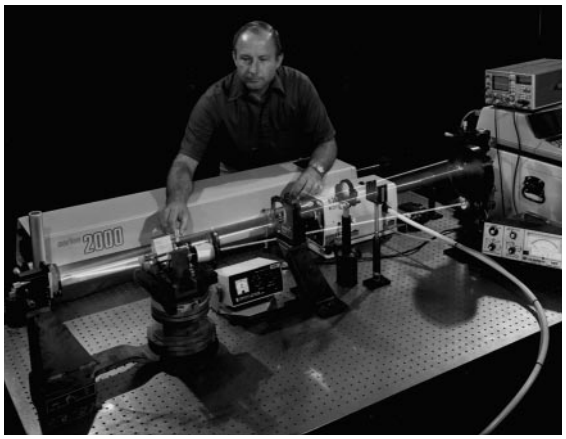
We can provide measurements of optical homogeneity, wavefront distortion, spectral performance, and evaluations of surface quality to levels of accuracy that are state of the art. Our surface-quality analytical capabilities include being able to perform high-quality microscopy, profilometry, and subsurface damage evaluations. We can evaluate surface figure and wavefront distortions for plano, spherical, and cylindrical optics. Also, using a multiple-bounce self-referencing technique, we can furnish highly accurate laser photometry and general spectral-response measurements over a wide wavelength range.

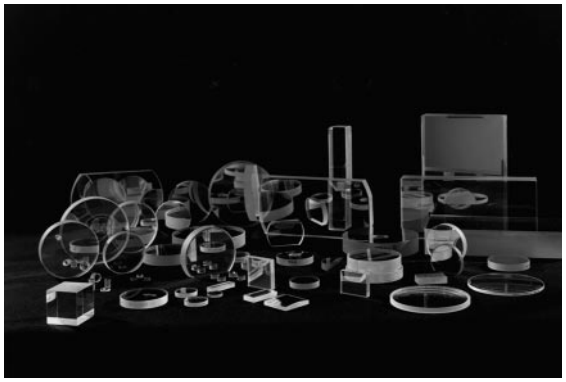
In addition, we can evaluate the effects of coating stress and spectral shifts in vacuum. With our high-average-power visible lasers operating at specific wavelengths, we can accurately measure optical-coating absorptions to 10 ppm as well as damage thresholds.

APPLICATIONS

- *State-of-the-art optical testing*
- *Highly accurate laser photometry*
- *Laser-induced spectral responses from materials over wide wavelength range*

Availability: This testing technology is available now. Because of the nature of our facilities and staff, we are regularly contacted by both universities and private industry to provide test support for one-of-a-kind R&D projects.





Optics designed, built, and tested for the AVLIS (atomic vapor laser isotope separation) Program at LLNL.

Contacts

John R. Taylor
Phone: (510) 423-4438
Fax: (510) 423-3134
E-mail: taylor10@llnl.gov
Mail code: L-462

Steve Johnson
Phone: (510) 422-8972
Fax: (510) 423-3134
E-mail: johnson65@llnl.gov
Mail code: L-462