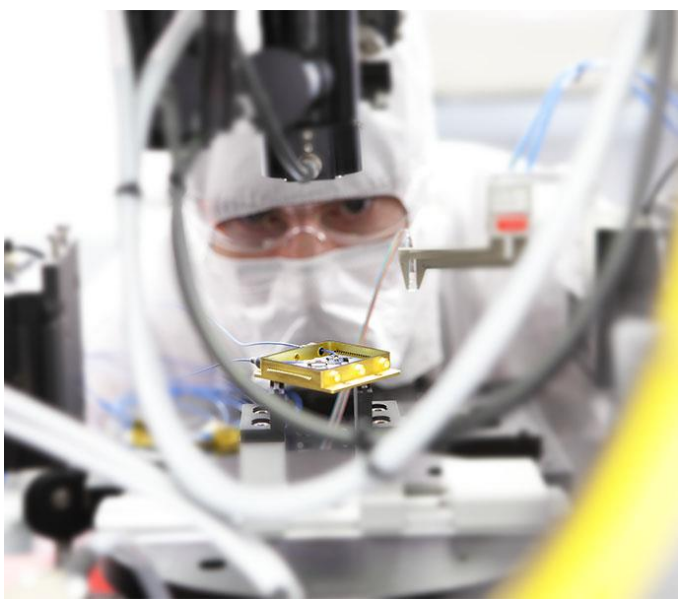
OPTICAL MEASUREMENTS

In order to stay on the technological cutting edge, INO renews and increases its very large equipment park every year for providing you the best optical engineering service in North America. Also, we provide optical testing and environmental testing for components or system.

- High precision fabrication and alignment
- IR and visible spectrum MTF measurements
- Interferometry and wavefront measurements
- Spectrophotometry, colorimetry, radiometry, photometry, and microscopy



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OPTICAL MEASUREMENTS : LIST OF AVAILABLE SERVICES

SPECTRAL MEASUREMENTS

- Characterization of the behavior of various materials as a function of wavelength (glass, plastics, metals, mirrors, anti-reflection coatings, interferential filters, fabrics, lotions, etc.)
- Direct or diffuse transmission
- Specular reflection (at normal incidence or at an angle)
- Diffuse reflection
- Wavelengths in the ultraviolet, visible, and infrared spectra
- Spectrofluorometry
- Fiber spectral characteristics

LUMINANCE AND CONTRAST

- Measurement of luminance
- Characterization of LED display panel contrast based on background luminance and display luminance measurements

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EMISSION SPECTRUM OF LIGHT SOURCES

- Characterization of a source relative intensity as a function of wavelength
- Incandescent sources, LED, fluorescent tubes, laser, etc.
- Wavelengths from the UV to the near-IR spectrum (200-1100 nm)

COLORIMETRY

- Quantification of the color of an object or surface by contact
- Results expressed in Yxy or L*a*b* color systems
- Possibility of differential measurements in relation to a benchmark
- Characterization of the color of various objects (plastics, fabrics, paints, foods, etc.)
- Characterization of the color of a light source or a distant object

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LUMINOUS INTENSITY AND ILLUMINANCE

- Characterization of the luminous intensity of a source based on an illuminance measurement taken at a given distance
- Illuminance measurements (lamps, LEDs, etc.)
- Characterization of the angular distribution of the intensity of a light source
- Possibility of photometric (based on human eye response) or radiometric (power) measurements

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INTERFEROMETRY

- Variety of measurements using a Zygo® interferometer:
- Surface flatness (windows, mirrors, prisms)
- Surface accuracy (lenses, curved mirrors)
- Radius of curvature of an optical surface (lenses, curved mirrors)
- Transmitted wavefront error (TWE) (windows, lenses)
- Angle errors and quality of wavefront transmitted by a corner cube

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WAVEFRONT MEASUREMENTS

- Wavefront sensor detects aberrations in optical components by measuring the shape of the transmitted or reflected wave front
- Useful to characterize the quality of optical surfaces, or to align components precisely by minimizing optical aberrations
- Three spectral bands available: visible to near-IR, MWIR, and LWIR

OPTICAL MEASUREMENTS : LIST OF AVAILABLE SERVICES

MTF (*MODULATION TRANSFER FUNCTION*) MEASUREMENT

- The visible spectrum
- Characterization of an optical system's effectiveness at resolving various levels of detail by measuring the contrast obtained at various spatial frequencies

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SURFACE MEASUREMENTS

- Interferometric 3D microscope (LEXT, NPFLEX)
- DEKTAK surface profilometer

CHARACTERIZATION OF THIN FILMS

- Tencor (stress measurements)
- Ellipsometer

CHARACTERIZATION OF OPTICAL FIBERS

- Spectral attenuation
- Absorption
- Fiber index profile measurements (EXFO NR9200)
- Fiber preform index profile measurements (PK2600)
- Birefringence measurements
- Cutoff wavelength
- Characterization and modeling of photodarkening in active fibers

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PRECISION ANGLE MEASUREMENT

- Measurement of the deviation between two optical surfaces using an autocollimator or goniometer
- Characterization of the parallelism of a window or prism angle

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LASER BEAM PROFILING

- Laser beam diagnostics using a CCD camera from ultraviolet to near infrared (i.e. 266–1300 nm) or a slit-scan pyroelectric detector from ultraviolet to far infrared (i.e. 190 nm–100 µm)
- CW or pulsed laser beam analysis: diameter ($1/e^2$ and 4s), divergence, quality factor (M^2 and BPP), astigmatism and asymmetry following the X/Y orthogonal axes
- Measurement method compliant with ISO 11146-1:2005

PRECISION MEASUREMENT USING A MICROSCOPE

- Various types of microscopes available depending on the required resolution: optical microscopes, scanning electron microscopes (SEM), or atomic force microscopes (AFM)
- Accurate measurements of component dimensions, images of particles measuring a few microns, surface roughness characterization, etc.

INSPECTION OF OPTICAL COMPONENTS

- Diameter or dimensions
- Thickness (center or edges)
- Surface flatness or radii of curvature, focal length
- Surface quality (roughness, scratch & dig)
- And more

ALIGNMENT OF CUSTOM OPTICAL SYSTEMS