

Custom Engineering | OPTICAL SYSTEMS

CVI Melles Griot designs and builds precision lens systems used by OEM customers to provide a competitive advantage for their products. Clear specifications jointly agreed upon with our customers ensure the right balance of performance, size, lifetime, and manufacturability.

Lenses are designed and optimized using industry standard design tools such as Code V[®], Zemax[®], TracePro[™], and SolidWorks[™]. Performance is analyzed over all necessary wavelengths and angles. Product performance is also analyzed over all critical environmental conditions.

We have extensive experience in simultaneously optimizing both the optical and the mechanical design of a lens. Lenses are designed to fit into a space envelope and can include a custom mounting interface. System analysis, lens tolerancing, and element sensitivity guide our engineers in selecting designs that may use potting, edge mounting, rebalancing, and pusher-cell technology.

Based on lens tolerance and sensitivity analysis, a mechanical design concept for the lens is selected. Mechanical designs often include the use of edge mounted and potted elements. Mechanical rebalancing and pusher cell technology is routinely used as required to optimize the performance of a lens.

Precision assembly capability is also critical to fabricating advanced lenses. Clean room assembly and air bearing alignment stations are used to obtain element centration as tight as 1 micron. Transmitted wavefront interferometry at the operating wavelengths is used for real-time system optimization and performance verification.

Products

- Diffraction limited lenses
- Aberration corrected optical systems
- Multi-element custom lenses
- Telecentric objectives
- Large field of view lenses
- Micro objectives
- Multi-spectral laser and imaging objectives
- Immersion objectives
- IR Objectives
- Scan lenses
- Machine vision lenses
- Eyepiece assemblies



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Electro-optical Assemblies

Combining our broad offering of optical components, mechanics, optical systems, and lasers with a global manufacturing base uniquely positions CVI Melles Griot to deliver custom electro-optical assemblies from the ultraviolet through the far infrared. Ranging from simple optomechanical devices to full turnkey systems, our extensive application knowledge and technical depth delivers rugged and reliable solutions that reduce time to market.

From design and prototyping through production, we employ a collaborative design approach that leverages extensive in-house Design Verification Testing and Environmental Verification Test processes. Our engineering work includes full system performance analysis and optimization, illumination design, stray light analysis, shock and vibration testing, design to weight and size constraints. The end-result is robust, reliable and highly manufacturable devices that reduce your system complexity and inventory carrying costs while significantly improving serviceability.

Key assemblies that we manufacture include:

- Fully engineered products designed to a performance specification
- Laser based light engine assemblies that integrate multiple lasers into a multi-wavelength platform
- Complex motorized zoom assemblies that may include custom objectives
- Build to print assemblies
- Component assemblies where a precision optical element is provided on a mechanical mount and certified for alignment and performance

Typical Assemblies include:

- Multi-laser Light Engines
- Complex Optical Systems
- Auto-alignment and Focusing
- Turnkey Sub-systems
- Color-corrected Optical Systems
- Illumination Systems
- Beam expansion and collimating systems

Applications and Markets such as:

Cytometry	FTIR
Microscopy	Raman
Genomics	Particle Analysis
Ophthalmology	Semiconductor Metrology
Industrial systems	Aerospace and Military

Custom and OEM Assemblies

- Aberration corrected lens
- Zoom lenses
- Laser benches
- Subsystems
- Window, dome and lens mounting in frames
- IR and visible heated windows
- Infrared/visible beamsplitters
- IR prism assemblies
- Chisel-nose windows

