For over 30 years REO has produced state of the art coatings, optics and assemblies for the world's leading optical system manufacturers. Today, we continue setting the standard for precision in optical components and assemblies providing solutions that are engineered for superior performance, reliability and value.

Our spirit of innovation, technical capabilities and manufacturing infrastructure make REO the ideal partner to enable your cutting edge technology.

ASSEMBLIES
Since its formation in 1980, REO has been integrating mechanical, electronic, and optical components to deliver complete optical assemblies. Supported by our expertise in optical fabrication and thin film coatings, our precision assemblies deliver superior optical and mechanical performance.

REO’s state of the art metrology equipment and highly controlled manufacturing processes ensure accuracy and precision in every assembly. The REO infrastructure includes dedicated materials management and qualified suppliers to support complex assembly builds. From simple mounted optics to custom lens cells, REO delivers the total value solution. Our mechanical, electrical, and optical engineers are equipped to enable build-to-print products or custom designed concepts. The result is superior quality, exceptional reliability, and optimized value to simplify your supply chain.

"Our business is very challenging from a technical standpoint... Without REO's support, we couldn’t imagine how we would be successful.

- Senior Optical Engineer from a semiconductor equipment manufacturer
The REO coating capability is unparalleled.
- Electro-Optical Engineer from a US defense contractor

COATINGS

From the deep UV to the long wave IR, REO possesses the industry’s most comprehensive manufacturing capabilities for thin film coatings. Our breadth of equipment allows the ideal coating and performance verification methods to be applied to your specific requirements delivering optimal performance, volume and value.

Our Boulder, Colorado facility contains over 30,000 ft² of ISO Class 7 cleanroom space, housing over 35 coating chambers, which include ion beam sputtering (IBS), ion assisted deposition (IAD), advanced plasma deposition (APD) and electron beam (E-beam) evaporative methods. This enables REO to deliver the highest performance and most cost effective solution for a broad range of coating needs.

OPTICS

Optical system reliability starts with the correct components and thin film coatings. Incorporating our ion beam sputtered thin films and superpolished substrates, our optics deliver the lowest optical loss and highest spectral accuracy. Designed to consistently deliver superior environmental stability, durability, and laser damage resistance, REO optical components span the spectrum for applications from the deep ultraviolet into the far infrared. Our components include:

- Mirrors
- Lenses
- Prisms
- Laser Crystals
- Polarizers
- Filters
- Beamsplitters
- Windows
LASERS

REO is a leading manufacturer of high performance HeNe lasers for demanding instrumentation applications such as confocal microscopy, ellipsometry, particle counting and food sorting. All of our HeNe laser mirrors are manufactured in-house, utilizing our unique combination of low scatter fabrication and coating techniques to produce superior output power and laser lifetime. Our stabilized laser product provides an ideal solution for laser-based instrumentation and metrology applications requiring long coherence length or high amplitude stability.

REO offers design-to-concept or build-to-print laser assembly solutions for instrumentation or process tool applications requiring customized technology. REO offers a wide selection of high performance HeNe lasers through our exclusive distributor Newport.

ASSEMBLIES ● COATINGS ● OPTICS ● LASERS

WHY THINK REO...

Partnering with REO solves many of the issues often encountered in obtaining high precision optics. In particular, sourcing substrates, coatings and assembly components from multiple suppliers can result in “finger pointing” if the final product fails to perform to specification. REO incorporates design, engineering, optical fabrication, thin film coating, assembly, and metrology all under one roof. The benefit is a single point of contact for program management, with a guarantee of consistent, high quality products.

REO is a partner that offers a unique combination of specialized technologies supported by the manufacturing capabilities of highly trained personnel to ensure that all your needs are met. If you are looking to gain consistent, precision optical solutions...

"REO has one of the most reliable coating capabilities of the many companies that we have engaged with, they have taken what used to be problem parts and overcome the issues that other suppliers did not...they have shown resourcefulness and strength of resolve to overcome difficult issues."

- Senior Buyer from a European defense contractor

ThinkREO"
APPLICATIONS

REO serves a variety of applications including aerospace and defense systems, industrial and scientific laser systems, semiconductor manufacturing and metrology tools, medical technologies, life sciences instrumentation, projection displays and telecom equipment.

SEMICONDUCTOR EQUIPMENT

In the ever-shrinking scale of microelectronic circuits, REO gives you a competitive advantage with optics that provide stability, long lifetimes, superior spectral and surface accuracy enabling higher resolution illumination and imaging.

AEROSPACE AND DEFENSE

Where harsh environments and demanding requirements leave no room for error, REO is a favored supplier to leading developers of advanced targeting systems, infrared countermeasure devices, directed energy weapons, laser communication technologies and navigational systems. This has been accomplished by consistently delivering optics that are durable, stable, reliable, cost effective, and uncompromising in optical performance.

LASERS

For over 30 years, REO has been a key supplier to the world’s leading laser manufacturers. REO is a unique partner that truly understands laser technology because we build lasers ourselves. Our resonator optics with low loss optical surfaces and optimized thin films deliver higher damage resistance and extended plasma durability. With coatings designed for line selection and parasitic suppression, these optics enable laser manufacturers to offer competitive products with improved performance and greater reliability at lower cost.

LASER MATERIAL PROCESSING

Cutting edge laser based materials processing applications require optics with a demanding mix of high efficiency, exceptional mechanical durability and environmental stability; all provided at competitive prices. REO leverages its unique mix of expertise in fabricating defect free surfaces, high density coatings and ultra-precise assemblies to deliver the highest possible performance for welding, cutting, marking, heat treating and micromachining applications.

PROJECTION DISPLAYS

Projection display technologies have been innovated to bring viewers information in a variety of environments. Whether for theatre entertainment or transparent data display, REO provides the laser, optical component, and assembly experience and a simplified supply chain to deliver an impressive technology of the highest quality.

MEDICAL

Photonics play a vital role in next generation health care technology; both in enhancing the ability to observe and measure symptoms as well as the capability to treat patients earlier with less invasive, more cost-effective methods. From cosmetic modifications to laser eye surgery and CT scans; our high quality optical components are responsible for safely delivering light-based treatments. Our extremely low absorption IBS coatings and epoxy free bonding techniques reduce excess heat in laser based medical systems increasing overall system efficiency and performance.
TECHNOLOGIES

FABRICATION
REO has world-renowned capability in optical fabrication and polishing of an extensive range of materials and geometries. Our master opticians utilize a wide range of fabrication technologies to deliver the optimum combination of performance and cost for systems from the ultraviolet into the infrared. While REO specializes in the production of ultra-low scatter, superpolished optical surfaces, our range of technologies also includes conventional plano, spherical and cylindrical polishing of glass and crystalline materials, as well as single point diamond turning of infrared materials.

THIN FILM COATINGS
REO was the first company to commercially offer ion beam sputtered (IBS) thin film coatings. Today we have expanded our IBS coating technology to cover the spectrum from the deep ultraviolet to the mid-infrared. We harness a versatile and wide range of thin film deposition technologies to ensure that the coating process is matched to your application, volume and cost requirements. These technologies include:

- Ion beam sputtering
- Ion assisted deposition
- Advanced plasma deposition
- Electron beam evaporation

Thin film engineering is the core technology of REO. Collectively, our team of thin film engineers has over 100 years of manufacturing and design experience. Utilizing the latest design tools, they are equipped to provide innovative solutions to enable cost effective and reliable manufacturing for your cutting edge products.

METROLOGY
In optics manufacturing, the ability to accurately measure what you fabricate is fundamental. REO has developed state of the art metrology for verification of all physical and optical performance parameters of our thin films, optical components and assemblies. Our in-house advanced metrology equipment measures surface and spectral performance from the ultraviolet to the infrared, optical loss at the ppm-level, dispersion, and laser damage resistance.

OPTICAL ASSEMBLY
REO specializes in the design and production of precise optical assemblies. Our skilled engineers provide mechanical and optical system design expertise to deliver assembled products with superior performance, reliability and cost characteristics. We have implemented unique assembly methods that yield outstanding centration in final multi-element assemblies, while simultaneously eliminating the need to hold tight and costly mechanical tolerances at the component level.

Expertly trained personnel work in dedicated environmentally controlled ISO Class 5 and Class 7 cleanroom facilities utilizing optimized alignment techniques to provide centration to 1 micron and active alignment to 1 arcsecond. REO pioneered the development of proprietary adhesive-free bonding techniques in the production of monolithic assemblies resulting in exceptional mechanical strength and ruggedness, with reduced scatter and improved beam quality and laser damage characteristics. REO delivers high performance and long term component stability, with a significant reduction in overall system cost.
CAPABILITIES

DESIGN FOR MANUFACTURE

The REO engineering staff includes over 25 individuals educated in optical coating, materials science, laser physics, mechanical, electrical and optical engineering. Acting as an extension of your own engineering and product development organization, we ensure that products are optimized for manufacturing and cost effective production. From component procurement to final conformance verification, REO is a partner ready to enable your most demanding technology.

OPTICAL ENGINEERING

REO is home to some of the most experienced thin film engineers as well as optical system engineers. With this combined expertise, REO is a manufacturing partner that provides optical solutions engineered for optimum manufacturing, performance verification, and superior reliability. From concept design or build-to-print, our engineers utilize the latest computer aided design and analysis software to consistently solve problems in creative and value driven ways.

PROCESS CONTROL

REO process engineering ensures that our production methods are repeatable and reliable providing you with consistent, cost effective results. Our team is expert in Six Sigma techniques, statistical process control, and critical process monitoring. Our operational processes are documented, audited, optimized and continuously improved. REO coating process controls include proprietary deposition monitoring software, ion source and gas flow control monitoring and recording, part specific documented work instructions and leak rate pressure trends and detection.

QUALITY

REO is dedicated to a program of total quality control and is ISO 9001:2008 certified. We monitor the effectiveness of all critical processes throughout our business and maintain strict document control to verify compliance with established procedures. We engage in Kaizen Events, value stream mapping and customer surveys to continuously improve our manufacturing operation, as well as our overall business. These efforts have been recognized by our customers and the industries that we serve with several prestigious awards for excellence in manufacturing and supplier partnerships. REO is a partner committed to accountability, reliability and to consistently meet standards for quality and performance.

The REO team really helped us to handle our increasing demand. Your flexibility and the ability to deliver additional quantities in a really short time was quite impressive.

- Production Manager from a German laser manufacturer
Located in Boulder, Colorado, our state of the art facility was built for the purpose of manufacturing optics and optical assemblies. Each manufacturing area is designed to enable the highest quality and efficiency in the optics industry. Our dynamic manufacturing space facilitates continual expansion of the capabilities, technologies, and products that we offer.

The 80,000ft² of manufacturing space includes state of the art fabrication, polishing, and metrology equipment as well as over 35 coating chambers. The optomechanical assembly area includes an ISO certified Class 5 assembly suite guaranteeing minimal particulates and foreign object debris throughout the alignment and assembly processes. The REO factory houses a unique combination of manufacturing equipment, capabilities and highly trained personnel to produce the world’s most demanding optical solutions.