

## **Replicated Optics**



*Cost-Effective Solutions for Optical Systems*

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**Your single source for custom replicated optics**

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***Holographix' Replicated Product Offerings:***

▣▣▣▣▶ *Metal Mirrors*

▣▣▣▣▶ *Aspheric Optics*

▣▣▣▣▶ *Glass Mirrors*

▣▣▣▣▶ *Parabolic Mirrors*

▣▣▣▣▶ *Glass and Plastic Lenses*

▣▣▣▣▶ *Optical Assemblies*

# Capabilities and Resources

## Replicated Optics

Replicated mirrors and lenses can directly replace conventional optics to provide lower-cost optical system solutions that are more compact and lighter compared to systems using conventional optics. Holographix produces high quality optical surfaces onto low-cost metal, glass, ceramic, or plastic blanks using our proprietary replication technology.

### Our customers achieve cost savings by:

- The use of lower-cost substrates
- Integrating low-cost mounting and alignment features into the blank
- Reducing assembly steps necessary to integrate the optic into the system

### Examples include:

#### Replicated Metal Mirrors

- Readily machinable materials (Al, Be, etc.) used for substrates
- Pre-machined alignment tabs, mounts and other design features
- Direct assembly into the final system
- Matching CTE for reduced distortion over temperature
- Lower machining cost vs. polished glass
- Reduced weight vs. glass optics
- Simplified system design by eliminating glass substrate and placing the mirror surface directly onto the metal mount

#### Replicated Aspherics

- Low-cost spherical blanks can be used
- Work effectively in both transmission and reflection
- Higher repeatability part-to-part compared to polishing
- Aspherics can be used in place of multi-element lens assemblies

### Standard Replica Properties

Wavelength Range:	190 nm to 15 $\mu$ m
Flatness/Curvature:	<math>\lambda/10</math> P-V
Scratch/Dig:	to 20-10
Temperature Range:	-50° C to 200° C
Humidity Range:	0 to 95% continuous
Chemical Resistance:	most common solvents
Damage Threshold:	>1 MW/cm <sup>2</sup>

## Company Experience

Over the past 25 years, Holographix has earned a reputation for providing our customers with outstanding development and manufacturing services for custom surface relief patterns. Custom binary and blazed gratings, micro-lens arrays, and diffractive waveguides are our main focus. With a company-wide emphasis on quality, Holographix maintains a rigorous Quality Assurance program designed to ISO9001-2008 standards.

## Replication Facilities

Production of replicated components requires a significant investment in capital equipment. Our 14,500 square foot facility in Marlborough, MA is equipped with:

- ADE and Zygo 4 phase-shift interferometers (Qty 4)
- ADT 7100 Dicing System
- AFM Workshop TT- Atomic Force Microscope (AFM)
- Amray 3600 Scanning Electron Microscope (SEM)
- Cary 500 UV-Vis-NIR Spectrophotometer
- Custom fully automated UV curing stations
- Denton DESK II sputtering systems (Qty 2)
- Denton Infinity 22 thin-film box coater
- Keyence VK-X260K Violet Laser Confocal Microscope
- March Plasma AP-1000 plasma treatment system
- Mitutoyo Vision Systems (Qty 2)

## Production Capabilities

Holographix specializes in the manufacture of custom replicated components in production quantities. The inherent speed of our cold-forming replication process allows us to offer economical volume pricing without the associated high tooling costs.

Please contact us via phone, e-mail, or fax with any inquiries you may have regarding our services. We will be happy to assist you!

For a more comprehensive overview of Holographix and our technology, please visit our website below.

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