

# Micro Optic Components

The growing use of compact, portable, and disposable optical devices challenges suppliers to maintain quality and performance while cutting size, weight, and cost.

Ross Optical's micro optics are not only competitively priced, but also backed by our in-house expertise in design, coating technology, test, inspection, and QA. Our micro optical components include many options available at diameters down to 1 mm:

- **Bi-convex** and **plano-convex** lenses, designed to form and shape light beams
- **Achromat lenses**, precision-fabricated to reduce chromatic aberration
- **Ball lenses**, used in many types of coupling devices
- **Prisms**, shaped to redirect and repurpose light energy
- **Aspheres**, shaped to condition light with reduced spacing and parts count

## Supporting Diverse Applications

Micro optic lenses and prisms are integral to the growth of several fields:

### Communications

Hand-held and miniaturized devices continue to grow more compact and more capable using micro optic elements.

### Instrumentation & Sensing

Small lenses and light-coupling devices support a growing number of instruments and sensors for mechanical and automotive systems.

### Visualization & Gaming Devices

Lightweight micro optics are increasingly used in goggles and sensing systems.

### Medical Devices

Probes, sensors, and imaging devices using micro optics allow early detection, diagnosis, and treatment for medical and dental equipment.

*Telemedicine is redefining healthcare, and many are turning to micro optics for smaller, more mobile instruments. Cupris Health, a UK-based medical device company, developed the prototypes of their smartphone platform ophthalmoscope and otoscope with Ross Optical catalog micro optics. [See sidebar.]*

## Unparalleled Service

Ross Optical delivers with exceptional service that is well-suited to the needs of our OEM customers. Using our years of optics experience, we help customers get the best quality and performance for their micro optics investment. Our world-class testing and inspection team works to make sure that our micro optic components meet high standards for quality and reliability. Exhaustive testing and inspection means significant cost and time savings for OEM customers. And thanks to our extensive in-house coating expertise, we can offer coatings performance for even the smallest micro lenses.

At Ross Optical, service continues beyond the sale. We're particularly proud of our inventory control management processes and work to provide an ongoing flow of parts that keep our OEM customers moving, without supply chain headaches and without the added cost of maintaining huge parts inventories.

**Ross Optical is ITAR Registered and ISO 9001:2008 Certified.**

**Miniaturization Without Compromise**  
Full range of custom and catalog micro optics



### Case Study: Cupris Health

Smartphone-based diagnostics that save lives



**Cupris Health** [cupris.com] was challenged to source stock micro optics for the prototype of their smartphone-based ophthalmoscope and otoscope. These ruggedized, multi-platform instruments require excellent image quality over a range of focal lengths, a robust, no-screw design, and high ease of use. A micro optic was needed that could meet these optical requirements and ensure that the “doctor in your pocket” could endure field use. As a supply chain partner, Ross Optical is meeting Cupris Health’s needs from prototype to global launch.



# Technical Specifications

Ross Optical provides optical components in various dimensions, such as micro optics (5 mm and smaller) and standard optics sizes. These components are available coated or uncoated.

## Plano-Convex Lenses

<b>Diameter</b>	1.0 to 6.0 mm
<b>Materials</b>	optical glasses, fused silica
<b>CT tolerance</b>	+/- 0.1 mm
<b>Centration tolerance</b>	< 5 min
<b>Irregularity</b>	0.5 waves
<b>Surface quality</b>	40-20 (MIL-PRF-13830)
<b>Bevel</b>	0.25 x 45 degrees
<b>Clear aperture</b>	at least 90% of diameter
<b>Design wavelength</b>	587.6 nm
<b>Focal length tolerance</b>	within +/- 2%

## Bi-Convex Lenses

<b>Diameter</b>	1.0 to 6.0 mm
<b>Materials</b>	optical glasses, fused silica
<b>CT tolerance</b>	+/- 0.1 mm
<b>Centration tolerance</b>	< 5 min
<b>Irregularity</b>	0.5 waves
<b>Surface quality</b>	40-20 (MIL-PRF-13830)
<b>Bevel</b>	0.25 x 45 degrees
<b>Clear aperture</b>	at least 90% of diameter
<b>Design wavelength</b>	587.6 nm
<b>Focal length tolerance</b>	within +/- 2%

## Achromats

<b>Diameter</b>	3.0 to 6.0 mm
<b>Materials</b>	optical glasses, fused silica
<b>CT tolerance</b>	+/- 0.2 mm
<b>Centration tolerance</b>	< 10 min
<b>Irregularity</b>	0.25 waves
<b>Surface quality</b>	40-20 (MIL-PRF-13830)
<b>Bevel</b>	0.25 x 45 degrees
<b>Clear aperture</b>	at least 90% of diameter
<b>Design wavelength</b>	587.6 nm
<b>Focal length tolerance</b>	within +/- 2%

## Ball Lenses

<b>Diameter</b>	0.3 to 12.0 mm
<b>Materials</b>	optical glasses, fused silica
<b>Sphericity</b>	0.25 $\mu$ (ball lenses 4 mm and under)
<b>Diameter tolerance</b>	2.5 $\mu$ (ball lenses 4 mm and under)

## Prisms

<b>Types</b>	right angle, equilateral, dove, wedge
<b>Materials</b>	optical glasses, fused silica
<b>Size</b>	1.5 mm and larger per side

