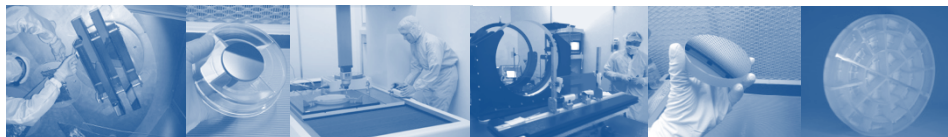


Okamoto Optics develops and manufactures a broad range of custom optics and thin film coatings for scientific research, high energy lasers, lithography, medical, and industrial products. Cylindrical Lenses and Mirrors are available sizes from 25-mm through 400-mm with calibrated surfaces up to $\lambda/4$. We apply advanced finishing techniques & technology to produce dependable high quality optics for commercial, aerospace & defense, scientific and industrial manufacturing applications.



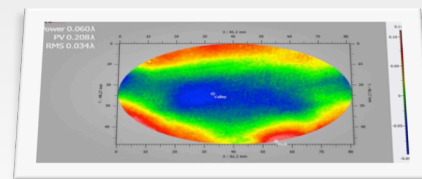
Cylindrical Optics 

Cylindrical optics (or "Cylinders") are lenses or mirrors characterized by curvature in one axis and flat in the orthogonal axis. This gives them the unique property of acting as a lens or focusing element in a single axis only. Cylindrical lenses form line foci instead of a point. This is useful in applications such as bar code scanning, laser projection, astigmatism correction, beam shaping, and illumination systems. Our customers use cylindrical optics in analytic instruments, lithography, scientific research and a variety of high-tech commercial applications. Cylindrical optics can be reflective or transmissive and can be plano-concave plano-convex or of various combinations of convex and concave to form specific focal lengths.

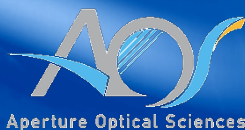


**Manufacturing
Capabilities**

- **Size:** 25-mm – 400-mm
- **Materials:** Fused Silica, Optical Glasses, Zerodur / Clearceram, & Silicon Carbide
- **Surface Accuracy:** up to $\lambda/4$
- **Surface Quality:** up to 20-10
- **Coatings Available:** Dielectrics, Anti-Reflective, Protected Aluminum, Silver or Gold
- High Damage Threshold Coatings available
- Design Services: Contact us for your special requirements
- Custom Opto-Mechanical components / mounts



Available outside of Japan exclusively from:



Aperture Optical Sciences, Inc.
27 Parson Lane, Unit G Durham, Connecticut 06422
T: (860) 316-2589 F: (860) 760-6564
www.apertureos.com

Cylinder Optics Fabrication with computer controlled polishing & Master Craftsmanship

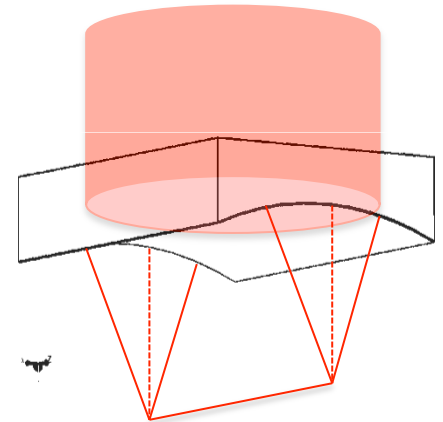
The Quality Advantage:

We believe intelligent manufacturing begins with a smart metrology strategy. We begin all our process plans from the final test plan and work back through the process integrating precise metrology throughout. We prepare detailed error budgets to all critical tests to ensure that the test data accurately reports the performance demanded by our customers' specifications. Our customers are invited to inspect our products on-site and participate in the final product qualifications. Interferometric testing of cylindrical optics requires the use of multiple technologies including:

- High Resolution Phase Measuring Interferometers
- Sophisticated Data Stitching Software
- Calibrated Spherical and Planar Reference Elements
- Computer Generated Holographic Cylinder References
- Precision Mechanical 3-D Coordinate Measurement

Okamoto Optics combines all of these technologies with process controls that guaranty the highest level of quality and precision, defining today's the state of the art.

Computer Controlled Polishing technology is employed for automatically grinding and polishing aspheric and other optical surfaces automatically and deterministically. Okamoto Optics Works applies three unique technologies; OptiPro advanced CNC generating, our own automated grinding and polishing machines, and QED's magnetorheological (MRF) polishing. Each of these technologies addresses the growing demand for inexpensive aspheric lenses and mirrors for industry and science.



Geometric Dimensions:

	Minimum (mm)	Maximum (mm)	Tolerance (+/- 0.10)
L:	25	400	0.05%
W:	25	400	0.05%
∅:	25	400	0.05%
R:	f/1	f/10	0.05%

Materials:

BK7, Fused Silica, Zerodur, Optical Glasses, Silicon Carbide

Optical Specifications:

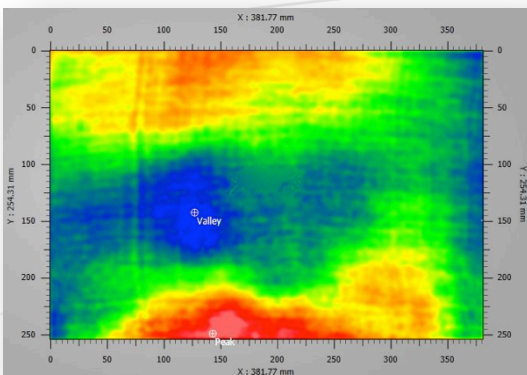
	Standard Grades			
	Grade 1	Grade 2	Grade 3	Grade 4
Surface Irregularity:	$\lambda/4$	$\lambda/2$	λ	2λ
Cosmetic Surface Quality:	60/40	40/20	20/10	

Coatings Available:

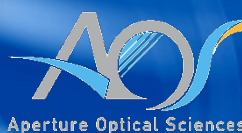
AR (visible and laser coatings for 527, 1053)
 Protected Aluminum
 Protected Gold
 Protected Silver

Aperture Optical Sciences Inc.'s mission is to provide its customers with optical components, systems and optically driven technologies that will fuel the growth of their businesses in the US, Japan, Europe and Asia. We are a privately owned US company and ITAR registered.

Our principal products are Silicon Carbide optics, Aspheric mirrors and lenses, laser optics, and opto-mechanical systems including precision beam steering systems, telescopes, and laser focusing systems. Our customers use our optics in high-energy lasers, airborne vision systems, remote sensing, optical lithography, and a variety of scientific research applications. We are the exclusive distributor of Okamoto Optics Works in Europe and North America.



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