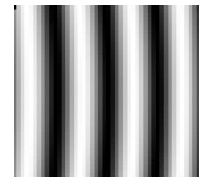


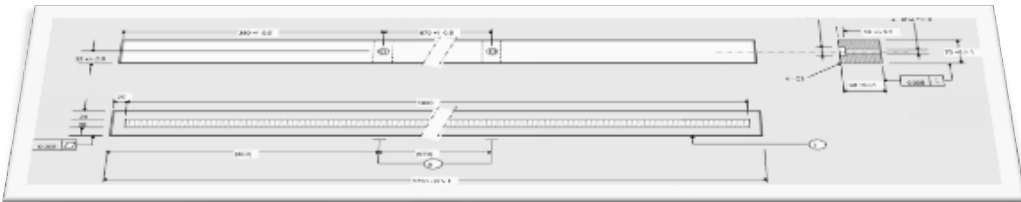
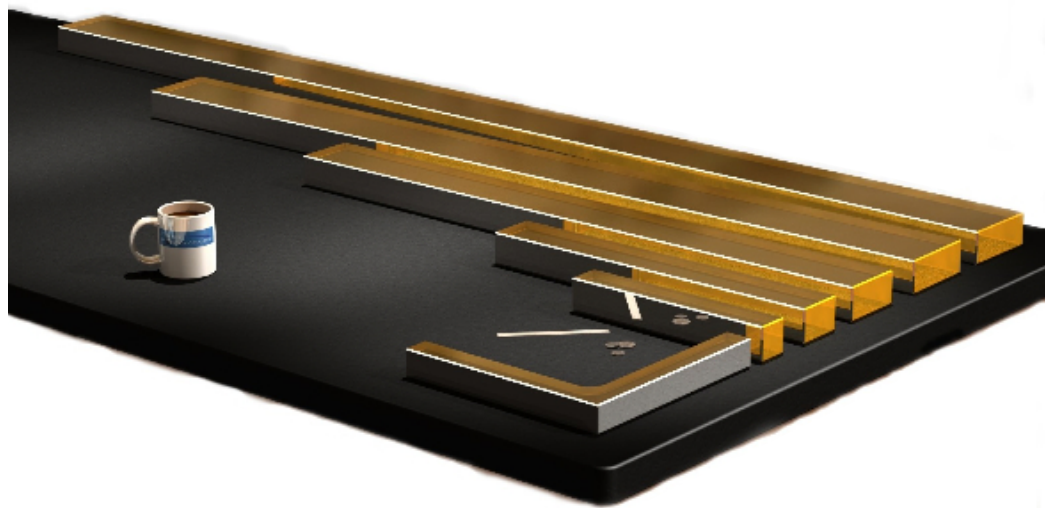


Aperture Optical Sciences

LINEAR REFERENCE MIRRORS

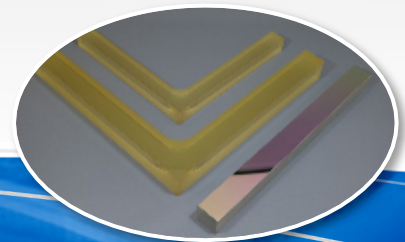


Linear Reference Mirrors for coordinate position referencing are available in lengths up to 3 meters. Aperture Optical Sciences Inc. provides sales, service, and engineering support with manufacturing by our collaborative partner, Okamoto Optics, of Yokohama Japan. Comprehensive design and assembly services are available on request. Contact us today for your specific requirements or to utilize our fully equipped US-based test and development laboratory.



SPECS AND OPTIONS

- Flatness** Up to $\lambda/100$ rms
- Diameter** 100 to 3000 mm
- Surface Quality** up to 20/10
- Coating** Al + SiO for R > 90% @ 633nm, normal incidence (additional options available)
- Materials** Ohara ClearCeram-Z®
Schott Zerodur®
Corning ULE®
SiC
- Custom Designs** Call for specifications and availability



APERTURE OPTICAL SCIENCES, INC.
 27 Parson Lane, Unit G
 Durham, Connecticut 06422
 T: (860) 316-2589 F: (860) 760-6564
www.apertureos.com, www.okamoto-optics.com

Engineering a linear reference mirror

Materials: Choosing the right material starts with your specifications, requirements for stability and thermal environment, reflectivity requirements, configuration, mounting approach and budget. We can provide data on each of these metrics to help you select the best value.

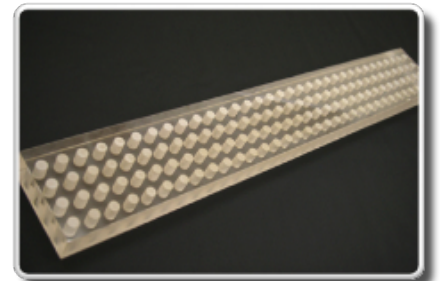
Flatness: Flatness is always a major cost driver and sometimes certain surface errors may be calibrated out. So its important not to over-specify this metric. We can assist in you to determine how flatness impacts your error budget.

Slope Error (gradient): Slope error is a key factor in the performance of stage mirrors in positioning systems. Because of their long and narrow geometry, the polishing processes employed to finish the surface often induce high slope errors, which can cause sharp, local beam deviations. High-resolution interferometry is needed to calibrate slope.

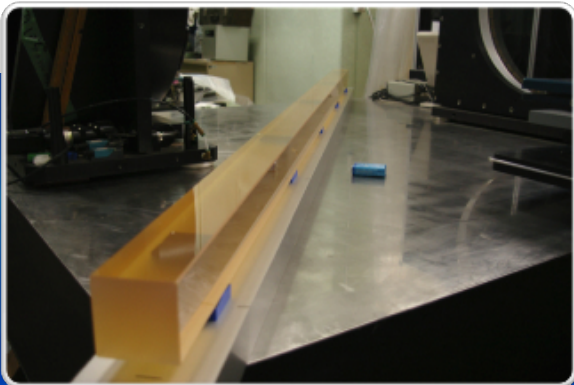
Mounting: Long and narrow mirrors are very flexible and easily distorted. We can provide mechanical design support to model anticipated deflection and then optimize the approach. After the mirror is fabricated we can test the mirror to verify the deflection tolerance and even provide a calibration file for error compensation. Assembly using invar inserts and vacuum compatible epoxy is also available.

Coating: We provide a variety of coating options including aluminum and silver, even dielectric multilayer coatings for most configurations. Most importantly, we will test and guaranty the mirror flatness after coating.

Calibration: We maintain the ability to provide a continuous high-resolution phase map of the entire surface up to 3-meters in length. We do this using a combination of large aperture interferometry, plus high resolution sub-aperture stitching. This allows us to accurately calibrate both surface and angular errors in the mounted configuration.



We provide optics ranging in size from a few millimeters to more than 2-meters in size of all material types: glass, metal, ceramic, and specialty materials like SiC and sapphire. Design services, coatings, test services, assembly and systems development also available.



Aperture Optical Sciences, Inc. works in collaboration with Okamoto Optics of Yokohama Japan to create custom optics, optical instruments, and systems to customers worldwide. We also provide opto-mecahnical design, applications engineering, and technology development services. Information on custom optics and extended services can be found at www.apertureos.com and www.okamoto-optics.com.

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