

Replicated Mirrors for Spectroscopic Instrumentation



Mirror Types

- Ellipsoid
- Paraboloid
- Toroid

Features

- Low scatter for UV applications
- Integral mount
- Achromatic focusing and collimation
- Light-weight
- Multiple substrate options
- Built-in kinematic adjustment options
- Enhanced thermal stability
- UV-IR and NIR-IR coating options

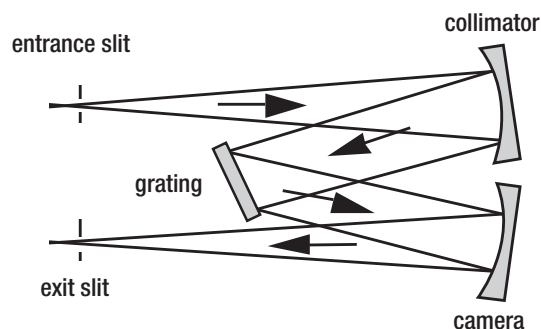
Most high-resolution monochromators and spectrographs use plane diffraction gratings to achieve spectral dispersion. These systems depend upon well-collimated light to achieve maximum performance. Newport's replicated Off-Axis Parabolic Mirrors provide the excellent resolution required to attain this performance. Using spherical mirrors in an off-axis configuration typically adds aberrations that can reduce the spectral resolution to a value well below that which the grating can provide. Off-axis parabolic mirrors provide aberration-free collimation and focusing. They also provide achromatic focusing for collimated beams and achromatic collimation for small light sources. These features can provide significant performance improvement over traditional mirror systems for monochromators and spectrographs.

Custom & OEM Specification Capabilities

Spectral Range	250nm to 15 μ m
Reflectance	85-99% dependent upon wavelength
Substrate Material Options	Aluminum, Aluminum Oxide, Beryllium, Fused Silica, Graphite Epoxy, Miralloy, Silicon, Silicon Carbide, Stainless Steel, Titanium
Mirror Size Range	3mm – 300mm (typical)
Surface Quality	E/E (60/40) per MIL-F-48616 (typical); D/C (40/20) or C/B (20/10) achievable
Surface Roughness	25 \AA (typical)
Operating Temperature	-80 to 160°F (typical)
Coating Adhesion & Humidity Resistance	MIL-F-48616
Coating Hardness (Al + MgF ₂ only)	MIL-F-48616 (modified to 0.5lb)
Wavefront Irregularity	1/2 wave @ 633nm (typical) (range from 2 waves to 1/8 wave)

Measurement Capabilities

Focal length	Up to 26"
Reflected Wavefront	Up to 4" beam phase-shift interferometer
X, Y, Z of focal point relative to mounting	Accuracy to 0.00010"
Coatings	Al + MgF ₂ or Au



The Czerny-Turner configuration uses two OAP's one to collimate the light diverging from the entrance slit and the other to focus the diffracted light to the exit slit or detector array

 SphereOptics

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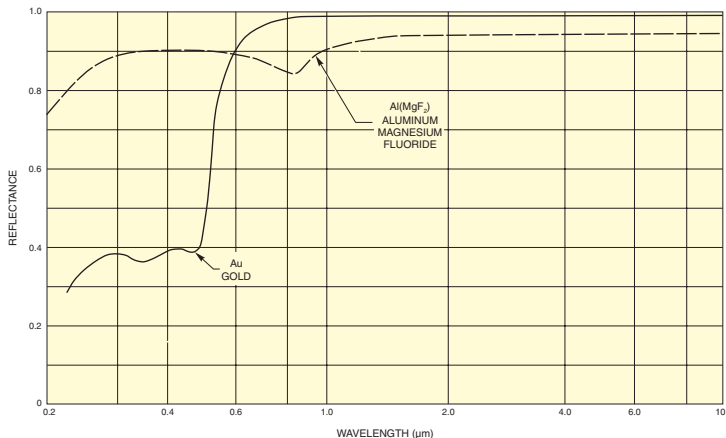
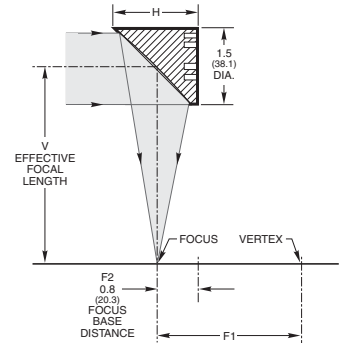
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Rapid-Delivery Off-Axis Replicated Parabolic Mirrors

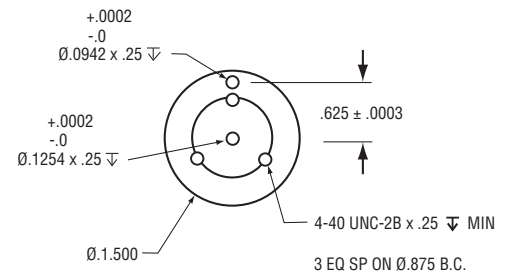
Our standard off-axis parabolic mirrors are circular segments from one side of a full paraboloid. The focal point is displaced from the mechanical axis, giving full access to the reflector focus area. There will be no shadowing when placing either a detector or source at the focus. The mirrors are achromatic and are offered in a wide range of working distances. Two coating options are available; protected Aluminum for UV and visible applications and bare Gold for infrared applications. The models listed are catalog versions of common OEM mirror designs.

Coatings

These reflectors are coated with pure Gold (Au) or Aluminum (Al), protected by a Magnesium Fluoride (MgF₂) overcoat. The Aluminum coating provides excellent performance for the UV – IR. For NIR – IR applications, unprotected gold coating is the preferred choice for maximum reflectance.



Typical reflectance of metallic reflector coatings



Common Specifications

Active Area	≥90% of diameter
Average Reflectance	≥85%
Surface Quality	E/E (60/40) per MIL-F-48616
Substrate Material	Aluminum
Surface Roughness	25Å (typical)
Operating Temperature	-80 to 160°F (typical)
Coating Adhesion & Humidity Resistance	MIL-F-48616
Coating Hardness (Al + MgF ₂ only)	MIL-F-48616 (modified to 0.5lb)
Wavefront Irregularity	≤2 waves @ 633nm(typical)

Ordering Information

Dimensions (inch)				Coated Al + MgF ₂	Coated Au
Height (H) (ref)	Effective Focal Length (V)	Focal Length (F1)	Focus Base Distance (F2)	Model	Model
1.600	0.800	0.400	0.8	50328AL	50328AU
1.691	2.000	1.000	0.8	50329AL	50329AU
1.620	4.000	2.000	0.8	50338AL	50338AU
1.597	6.000	3.000	0.8	50331AL	50331AU
1.585	8.000	4.000	0.8	50332AL	50332AU

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