

Reflective Microscope Objectives



- Wide spectral band
- Long working distances
- High numerical apertures
- Zero chromatic aberration
- Negligible coma, spherical, and astigmatic aberrations

Applications

- UV Metrology and Microscopy
- Spatial Filtering
- Photomicroscopy
- Laser Energy Delivery Systems
- FT-IR Spectroscopy

Newport Reflective Microscope Objectives are reverse Cassegrains following the Schwarzschild design. Accordingly, they have zero chromatic aberration, and negligible coma, spherical, and astigmatic aberrations. We offer 15X and 36X objectives, broadband coated with aluminum and over coated with magnesium fluoride (MgF_2). They are usable from 200nm to 20 μ m. Special coatings are available upon request including MgF_2 optimized for the 157 to 195nm region, and gold for the visible to IR region.

Construction

Newport's reflective microscope objectives are fabricated from a single material providing a uniform thermal coefficient of expansion. Each objective contains two highly polished electroless nickel spherical mirrors. The mirrors are coated with aluminum and magnesium fluoride. Average reflection per surface of each mirror is 85% in the UV-VIS, and 90% in the IR (with a dip to 76% at 820nm).

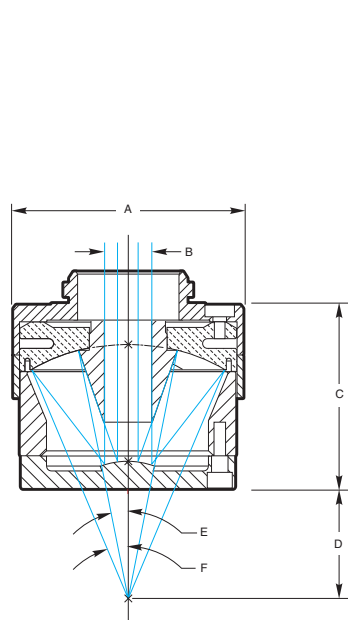
The primary mirror has a spherical concave surface with a center hole. The secondary mirror is a small convex spherical mirror that is machined into the spider assembly. The objectives are hand assembled in interferometric alignment fixtures allowing each pair of mirrors to be optimized as a set to achieve maximum resolution. Spot sizes of 2 μ m for the 15X objective and 1 μ m for the 36X objective are typical.

How They Work

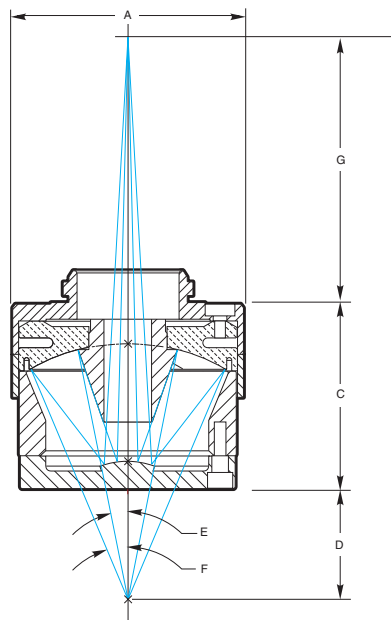
In a typical focusing application, collimated light passes through the aperture hole in the primary mirror to the secondary mirror. The secondary mirror reflects and diverges the beam to fill the primary mirror. The primary mirror focuses the beam to a small spot called the Object Plane or Focal Point.

Specifications

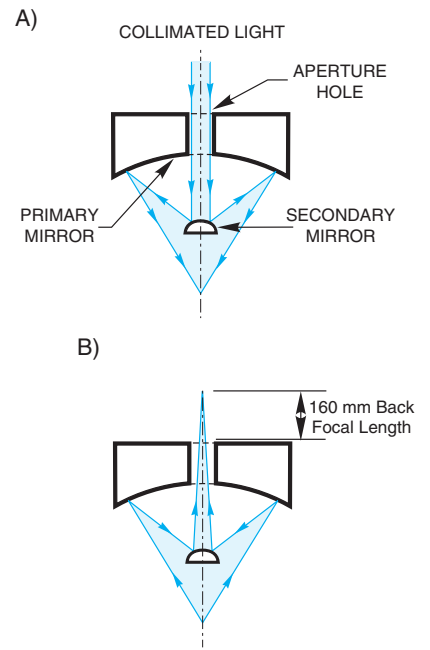
Model	Magnification	Numerical Aperture	BFL (mm)	Working Distance (mm)	Field of View (mm)	Focal Length (mm)	Obscuration (%)	Secondary Mirror Diameter (mm)
50105-01	15X	0.4	160	24.0	1.2	13.0	27	10.5
50105-02	15X	0.4	Infinite	24.0	1.2	13.0	27	10.5
50102-01	36X	0.52	160	10.4	0.5	5.4	17	5.6
50102-02	36X	0.52	Infinite	10.4	0.5	5.4	17	5.6



Dimensional diagram of Newport Infinite BFL Reflective Microscope Objective



Dimensional diagram of Newport 160 mm BFL Reflective Microscope Objective



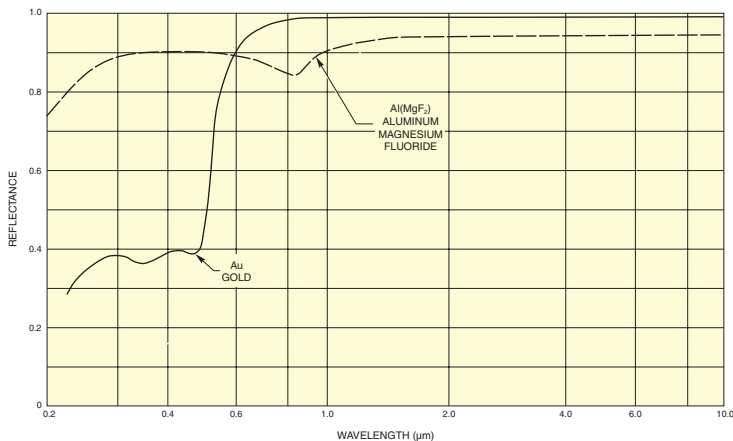
A) Diagram of a typical focusing application of a reflective microscope objective
 B) Illustration of the rear focal plane of a 160 mm back focal length objective

Dimensions

Dimensions [in. (mm)]

Model	A	B	C	D	E	F	G
50105-01	1.94 (49.3)	N/A	1.52 (38.6)	0.94 (24.0)	12.0°	23.6°	6.30 (160.0)
50105-02	1.94 (49.3)	0.383 (9.72)	1.52 (38.6)	0.94 (24.0)	12.0°	23.6°	N/A
50102-01	1.94 (49.3)	N/A	1.52 (38.6)	0.41 (10.4)	15.0°	30°	6.30 (160.0)
50102-02	1.94 (49.3)	0.212 (5.3)	1.52 (38.6)	0.41 (10.4)	15.0°	30°	N/A

Mounting threads are 0.800-36 RMS



Typical reflectance curves of metallic reflective coatings

Ordering Information

Model	Magnification	BFL (mm)
50105-01	15X	160
50105-02	15X	Infinite
50102-01	36X	160
50102-02	36X	Infinite

Custom Reflective Microscope Objectives can be supplied with other magnification values and custom configurations.



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