

Description

Reflecting objectives are renowned for their unique optical properties. Beck Optronics Solutions is one of very few companies worldwide designing and manufacturing them. Originally designed for microscopy in 1904, they are based upon a two mirror system. The all-reflecting optics mean that, in contrast to refracting objectives, they are totally free from chromatic aberrations. By careful selection of the mirror curvatures and their separation, they are corrected for spherical aberration, coma and astigmatism, leading to diffraction limited imaging performance. In addition to these corrections, reflecting objectives have the following advantages when compared to standard refracting microscope objectives:

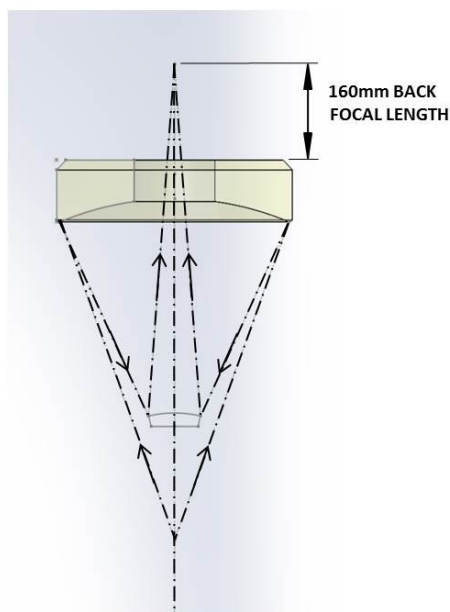
- Longer working distances relative to the magnification;
- Large numerical apertures for improved light gathering power;
- High throughput from UV to far infrared;
- Coatings available to enhance performance at specific wavelength regions.



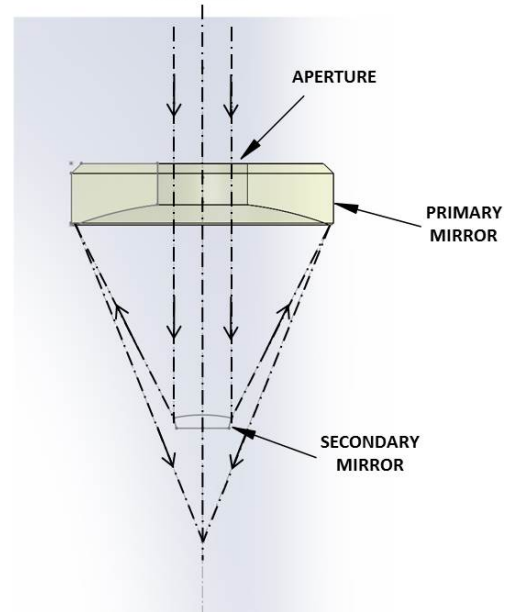
Applications include conventional microscopy and beam delivery systems. With their unique lack of chromatic aberrations they excel especially where a dual wavelength operation is required, such as alignment to a visible beam for working with an IR or UV beam laser. Other uses include:

- FT-IR spectroscopy;
- UV metrology and microscopy;
- Semiconductor wafer inspection;
- Photomicroscopy;
- Photolithography;
- Thin film measurements;
- Laser beam delivery systems;
- Laser drilling and etching;
- Product marking;
- Laser pumping;
- Thermal imaging microscopy.

A) MICROSCOPY



B) BEAM DELIVERY SYSTEMS



PROPERTY	BECK OPTRONIC SOLUTIONS MODEL No					
	5001-000	5002-000	5003-000	5004-000	5006-000	5007-000
Magnification	x15	x15	x25	x36	x52	x74
Numerical aperture	0.28	0.50	0.40	0.50	0.65	0.65
Focal length (mm)	13.35	13.41	8.00	5.41	3.55	2.54
Visual FOV (mm)	1.20	1.20	0.72	0.50	0.34	0.24
Obscuration	18.90%	19.50%	16.70%	12.20%	16.70%	13.30%
Transmitted wavefront error	$\leq \lambda/4$ P-V, $\lambda/14$ RMS @633nm					
Working distance (mm)	24.5	23.2	14.5	8.6	1.9	1.0
Small mirror diameter (mm)	7.30	13.40	6.30	5.60	4.60	3.35
User adjustment for tube-length & cover glass thickness	Fixed (factory set)	Fixed (factory set)	Fixed (factory set)	Yes	Yes	Yes
Range of cover glass thickness	0 - 3.0mm*	0 - 3.0mm*	0 - 3.0mm*	0 - 1.0mm	0 - 1.0mm	0 - 1.0mm
Range of Tube-length (mm)	80 - ∞ *	80 - ∞ *	80 - ∞ *	90 - ∞	120 - ∞	120 - ∞

* Factory set for one cover glass thickness and one tube length. To be specified at the time of ordering.

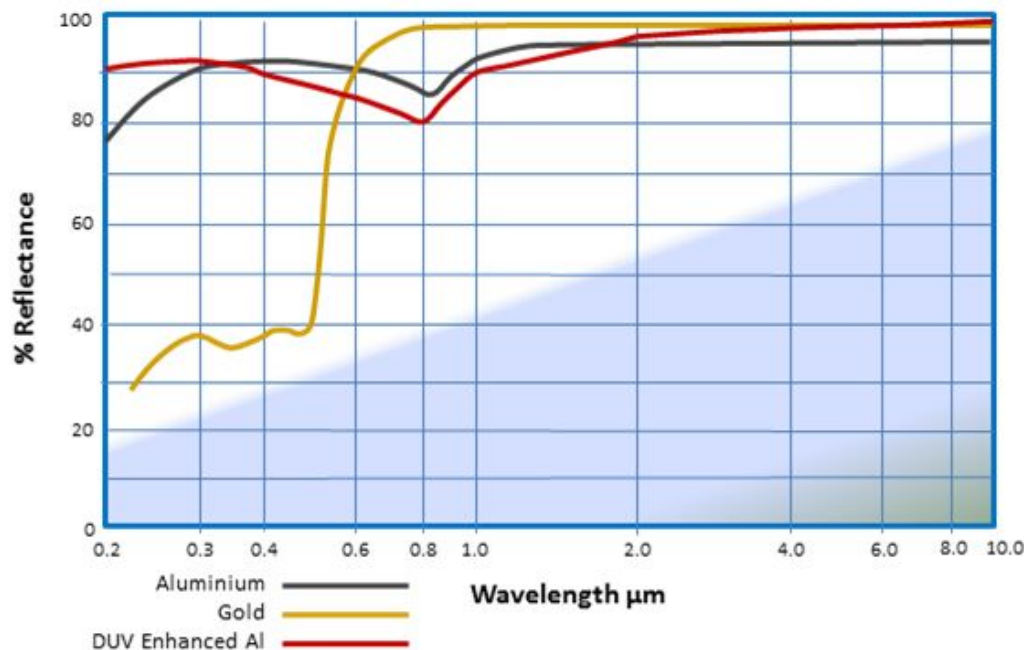
The standard objectives are supplied with aluminium coated mirrors. This gives the widest spectral coverage from UV to far IR, but limits the objective to low power use only. In applications requiring high power, we offer alternative coatings as detailed below. For specialised applications we can provide other specialist coatings.

RANGE	REFLECTANCE	COATING	SUFFIX
250nm to 10 μ m	89.0% average	Aluminium	-000
190nm to 10 μ m	>89.0%	DUV Enhanced Aluminium	-190
700nm to 15 μ m	98.0%	Gold	-120

Note: Our standard objectives have a 3 legged spider (to support the secondary mirror) which minimises diffraction but produces a six point flare pattern. A 4 legged spider produces more diffraction but only has a 4 point flare pattern and some users prefer this. Add postfix 4 to part number for a 4 legged spider when you order (3 legs are supplied as standard).

Notes: If back reflections may be an issue in your application a matt black dimple can be ground into the secondary (smaller) mirror. Add postfix -D to the part number.

If you require a clearance hole through the secondary mirror please contact us to discuss the options available.



About Beck Optronik Solutions

BOS has a reputation for excellence in design and manufacture of precision optics that can be traced back over 175 years. Based near London, UK, BOS delivers complex, integrated electro-optic systems for defence and commercial use across the electromagnetic spectrum from UV to LWIR.

For pricing or further information please contact us at:

t: +44 (0) 1442 255755 | f: +44 (0) 1442 210770 | e: info@beckoptronic.com | www.beckoptronic.com