New Products 2010

LightPath® TECHNOLOGIES™

Blue Laser Collimating Lenses

- Ideal for biomedical instrumentation and data storage systems
- Designs optimized for 405 nm & 488 nm laser diodes
- Diffraction limited molded aspheric glass lenses
- Compact, single lens design

LightPath's Blue Laser collimating lenses are designed to simplify the design of laser systems for biomedical instrumentation such as cytometers and fluorescence detection and high volume data storage applications. These lenses are optimized, designed and manufactured to meet extremely stringent optical standards for these high performance applications.

Achieving good beam quality is particularly difficult for shorter wavelength lasers. These new molded glass aspheric lenses are designed for the specific beam divergences, peak wavelength and window material of commercial blue diode lasers, enabling blue laser applications to achieve excellent beam quality and performance.

The L-LAL12 and D-LaK6 glasses have been selected for their outstanding UV & Blue transmission properties and their ability to be molded using LightPath's existing molding technology. These glasses are fully RoHS compliant, in accordance with the new European restrictions on hazardous substances.

These lenses are available as mounted lenses in LightPath's MT lens holders.

Contact LightPath to take advantage of the power of Aspheric Optics for a simpler optical system.

Blue Laser Collimating Lenses

Lens Code	Design Wavelength	Glass	Numerical Aperture	Focal Length (mm)	Outer Diameter (mm)	Clear Aperture (mm)	Working Distance (mm)
356300	405 nm	L-LAL12	0.66	2.54	4.00	3.30	1.55
356785	488 nm	L-LAL12	0.62	1.42	2.75	1.70	0.86
357765	488 nm	D-LaK6	0.61	4.00	6.325	4.80	2.37
357775	405 nm	D-LaK6	0.60	4.02	6.325	4.80	2.41

All Blue Laser Lenses are available with LightPath's standard MLBB-A anti-reflection coating for 400 nm to 600 nm.

RoHS Compliant Glass Aspheres for Telecommunications

- Achieves RoHS compliance with a high index glass
- Designed for high volume production
- Molded lenses for greater performance and repeatability
- Lenses are molded into holders for easy assembly

Molded aspheric lenses made from high index lead-based glasses have long been used in laser to fiber coupling systems inside of transceiver packages. RoHS compliance has been difficult to achieve based on the high performance requirements of these systems and the advantageous properties of lead-based glasses. LightPath Technologies has developed a set of lenses using a high index, RoHS compliant glass that replaces LightPath's current lead glass based products and meets the RoHS standards.

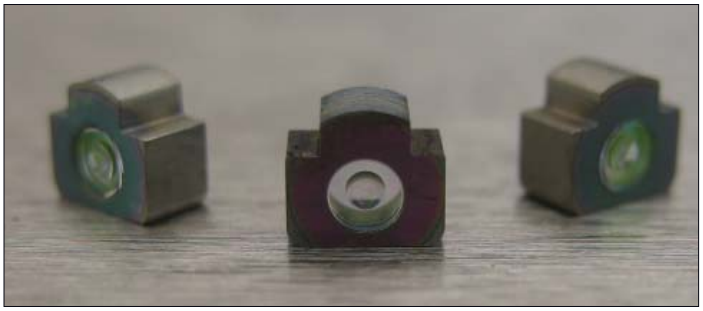
Contact LightPath to take advantage of the power of Aspheric Optics for a simpler optical system.

RoHS Compliant Telecommunications Lenses

Lens Code	Numerical Aperture	Focal Length (mm)	Outer Diameter (mm)	Clear Aperture (mm)	Working Distance (mm)	Holder
355410	0.20	2.51	1.805	1.01	1.84	None
355536	0.60	0.60	2.0 x 2.2 (T - Shape)	0.72	0.22	T Holder
355880	0.60	0.70	3.00	0.84	0.29	Cylindrical
355940	0.17	4.0	3.00	1.37	3.36	Cylindrical
355945	0.10	2.51	3.00	0.51	1.755	Cylindrical

LightPath's D-ZLAF52LA Glass is used for all Lenses.

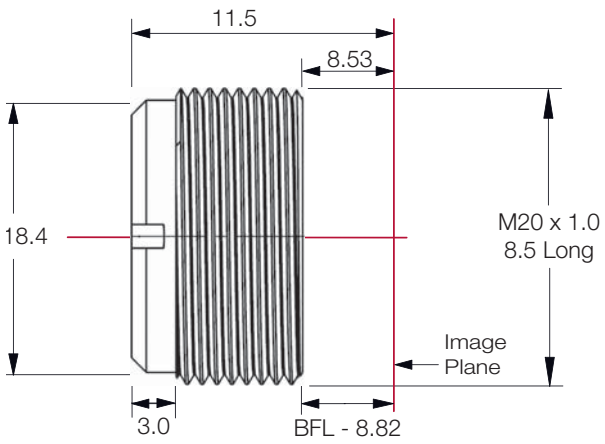
Standard Coatings
MLBB-A Coating: 400 nm - 600 nm
MLBB-B Coating: 600 nm - 1050 nm
MLBB-C Coating: 1050 nm - 1600 nm
MLBB-Q Coating: 1300 nm - 1700 nm



- Optimized for LWIR Thermal Imaging from 8 µm – 14 µm
- Molded lenses using Black Diamond™ chalcogenide glass
- Reduced focal shift with temperature due to inherent glass properties
- Molded lenses for repeatable, cost effective manufacturing
- Designed for uncooled IR sensors

Part Number 7100108: Black Diamond™ Lens Assembly

Drawing



Optical Properties	
Focal Length	10.65 mm
f/#	1.0
Back Focal Distance	8.53 mm to Housing / 8.82 mm to Lens
Diagonal FOV	52°
Diagonal Image Size	10 mm
Pixel Pitch	25 microns
Transmission	~ 90% (average)
Wavelength Range	8 µm – 14 µm
Glass Material	BD-2
Focus	Fixed Focus
Athermalized	No
Mechanical Properties	
Weight	10.9 g
Lens Mount	M20 x 1.0 - 6g
Environmental Properties	
Operating Temperature	25°C to 75°C

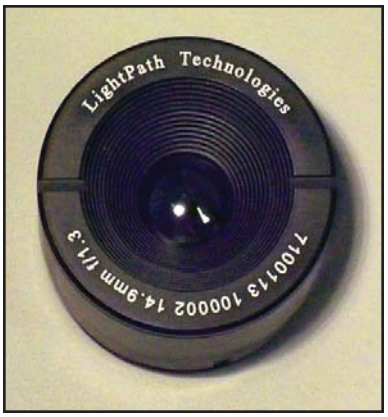
Thermal Imaging Lens Assemblies

The increased demand for thermal imaging and thermography is driving an increased demand for IR optical systems. Traditional IR systems incorporate Germanium or Zinc Selenide optical assemblies. However, these assemblies can be expensive due to the time and expense of diamond turning high performance aspheric surfaces.

LightPath's Infrared Lens Assemblies are specifically designed to be replacements for standard Germanium or ZnSe based IR optical assemblies. These lens assemblies integrate our Black Diamond molded chalcogenide lenses into a complete ready-to-use package.

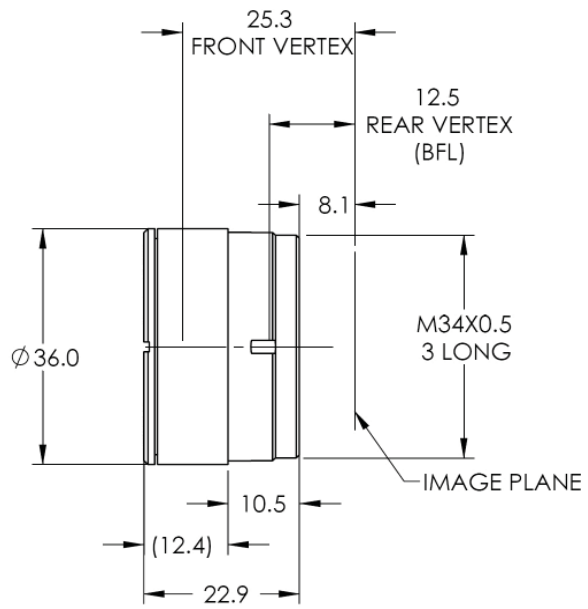
These lens assemblies are designed and optimized for the 8 - 12 micron wavelength range for use with uncooled infrared sensors. Molded IR lenses are a lower cost substitute for traditional high volume diamond-turned optics.

Black Diamond lenses also provide better thermal stability through a smaller dn/dT than Germanium. This inherent material property allows system designer to greatly reduce or eliminate complex athermalization mechanics from the optical assemblies.



Part Number 7100113: Black Diamond™ Lens Assembly

Drawing



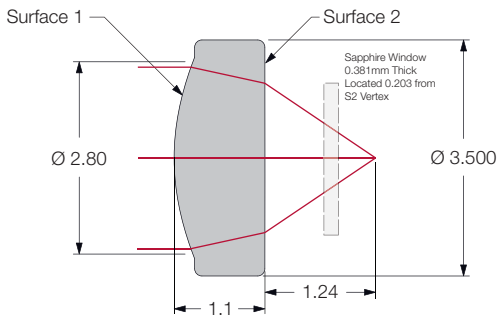
Optical Properties	
Focal Length	14.9 mm
f/#	1.33
Back Focal Distance	8.1 mm to Housing / 12.5 mm to Lens
Diagonal FOV	60°
Diagonal Image Size	15.2 mm
Pixel Pitch	25 microns
Transmission	~ 90% (average)
Wavelength Range	8 µm – 14 µm
Glass Material	BD-2
Focus	Fixed Focus
Athermalized	Yes
Mechanical Properties	
Weight	50.5 g
Lens Mount	M34 x 3.0 mm - 6g
Environmental Properties	
Operating Temperature	-40°C to 85°C

MWIR / LWIR Collimating Lenses

- High numerical aperture for maximum collection efficiency
- Compact, single lens design
- Diffraction limited performance
- RoHS Compliant

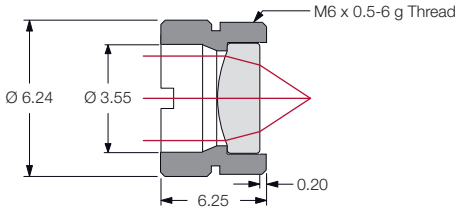
MWIR/LWIR collimating lenses have a high numerical aperture for maximum light collection for collimating light from MWIR and LWIR lasers, including quantum cascade lasers (QCL). The aspheric design enables a single lens to replace a complex multiple component optical system.

Lens Code 390017



Optical Glass Material	BD-2
Design Wavelength	2.3 µm
Numerical Aperture (NA)	0.72
Clear Aperture (CA)	2.6 mm
Effective Focal Length (EFL)	1.5 mm ± 1%
Magnification	Infinite
RMS WFE	< Diffraction Limited
Outer Diameter (OD)	3.50 mm
Working Distance (WD)	1.24 mm
Center Thickness (CT)	1.10 mm

Mounted MWIR/LWIR

390017XX-MT	General Specifications and Tolerances	
	Holder Material	Stainless Steel 304
	Holder Outer Diameter	± 0.025 mm
	Holder Inner Diameter	± 0.100 mm
	Holder Length	± 0.100 mm
	Length of Threaded Section	± 0.100 mm