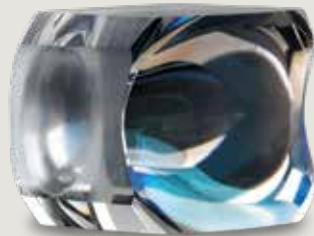


**GLOBAL LEADER** IN OPTICAL TECHNOLOGY

**LightPath**<sup>®</sup>  
..... TECHNOLOGIES



## **Geltech Molded Aspheric Lenses**



[www.lightpath.com](http://www.lightpath.com)

# ABOUT LIGHTPATH TECHNOLOGIES



LightPath Technologies, Inc. (NASDAQ: LPTH) is a leading global, vertically integrated provider of optics, photonics and infrared solutions for the industrial, commercial, defense, telecommunications, and medical industries. LightPath designs, manufactures, and distributes proprietary optical and infrared components including molded glass aspheric lenses and assemblies, infrared lenses and thermal imaging assemblies, fused fiber collimators, and proprietary Black Diamond™ (“BD6”) chalcogenide-based glass lenses. LightPath also offers custom optical assemblies, including full engineering design support. The Company is headquartered in Orlando, Florida, with manufacturing and sales offices in Latvia and China.

LightPath’s wholly-owned subsidiary, ISP Optics Corporation, manufactures a full range of infrared products from high performance MWIR and LWIR lenses and lens assemblies. ISP’s infrared lens assembly product line includes athermal lens systems used in cooled and un-cooled thermal imaging cameras. Manufacturing is performed in-house to provide precision optical components including spherical, aspherical and diffractive coated infrared lenses. ISP’s optics processes allow it to manufacture its products from all important types of infrared materials and crystals. Manufacturing processes include CNC grinding and CNC polishing, diamond turning, continuous and conventional polishing, optical contacting and advanced coating technologies.



## OUR VISION

Grow LightPath Technologies into an optical solution company that is a fully integrated manufacturer and supplier of visible and infrared optical components and sub-systems, based on world class optical manufacturing technology.





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## CHOOSE FROM A VARIETY OF FORM FACTORS FOR CUSTOM DESIGNS

LightPath's unique molding process allows us to custom manufacture lenses based on specific requirements. We can provide lenses in a number of different form factors from a simple aspheric lens, to a lens array, and even a lens molded into a metal housing. Some of LightPath's lens molding capabilities include:

- Lens Arrays
- Anamorphic Lenses
- Insert Molding (molded into a metal holder)
- Cylindrical Metal Holders
- Square Holders
- T-Holders
- Custom Holders
- Freeform Optics



### C-LENS (MOLDED ASPHERIC)

Custom available C-Type Aspheric lenses (collimating rods) are offered as part of the small beam air-gap collimator assembly. These are available as molded lenses having an angled plano surface on one end to prevent back reflections and an aspheric surface on the other. Compared with our standard molded aspheres, these lenses offer the same superior optical performance, however, in a rod form compatible with fiber integration. These lenses offer unprecedented technological advantages for low loss fiber coupling applications such as optical telecommunications, and advanced aerospace communication systems.

### NUMERICAL APERTURE

Our molded aspheric lenses are available with numerical apertures ranging from 0.15 up to 0.77. Applications that would use a low numerical aperture include bar code scanners, surveying instruments, and small weapons sights. High numerical aperture applications include data storage and industrial printing.

### SHAPES AND SIZES

With lenses available in a multitude of shapes and sizes, up to 23mm in diameter, LightPath will be able to provide you with the perfect lens for your unique application.

### DIFFRACTIVE HYBRID LENSES

Combining a refractive aspheric lens with a diffractive feature can achieve sophisticated beam shaping of laser light. Diffractive hybrid lenses can also be used to make a system achromatic over a range of wavelengths. LightPath hybrid lenses can be customized to each application.

### DIFFRACTION LIMITED PERFORMANCE

Most LightPath lenses are designed to be diffraction limited, and are measured on a phase shift interferometer.

## ASSEMBLIES

By leveraging our broad optical component portfolio, LightPath has been implementing sophisticated integrated optical assemblies. Our in-house engineering staff can design custom assemblies, including complex imaging systems for camera systems, to your exact specifications. Additional services include thermal analysis and athermalization for better performance across a large temperature range.

## GLASS DICING AND LENS EDGING

LightPath has the ability to dice lenses and glass to precision shapes and sizes. We can dice optics within a tolerance of  $\pm 5\mu\text{m}$  and hold edge chipping  $<15\mu\text{m}$  depending on the condition of glass used. In addition, we can dice lens center lined to edge within microns. We have experience in dicing lens arrays, wafers and custom lens shapes. LightPath uses multi-blade dicing gangs to increase our capacity to dice in higher volumes.

## FREEFORM

Freeform optics involve optical designs with at least one freeform surface which has no translational or rotational symmetry about axes normal to the mean plane. LightPath's precision glass molding is a viable process for the cost-effective volume production of freeform optics.

Manufacturing Tolerances	
Parameter	Typical Tolerance
Focal Length	$\pm 1\%$
Center Thickness (CT)	$\pm 0.025\text{mm}$
Outer Diameter (OD)	$\pm 0.015\text{mm}$
Wedge (arcmin)	4
Power/Irregularity (fringes)	3/1
Surface Roughness	15nm
Surface Quality (scratch/dig)	40/20
RMS WFE	Diffraction Limited

## CUSTOMIZABILITY

LightPath offers the option to design a custom lens to meet your specifications. Our in-house engineering and manufacturing teams will work with you to design a lens to meet your unique needs. LightPath also offers a wide range of custom coatings. Custom coatings include dual band, triple band, and V anti-reflection coatings. LightPath can also provide reflectivity coatings for aspheric mirror applications.

## INSERT MOLDING

LightPath's lenses can be molded directly into metallic holders, allowing the lenses to be welded or soldered into the package and eliminating the need to use epoxy. This can be an ideal solution for high volume automated assembly or in applications where strict outgassing requirements preclude the use of epoxy adhesives.

Contact us today for a quote on your custom design.



**DID YOU KNOW?**

We can blacken the edge of your lens.

# STANDARD ASPHERIC DESIGNS

## HIGH-PERFORMANCE OPTICS FOR A VARIETY OF APPLICATIONS

- Benefit from the quality and performance of all-glass aspheres
- Easily transition from prototype phase to high-volume production
- Customize to fit your application or choose from over 100 standard aspheric designs
- RoHS-compliant, ultra-high quality glass

Aspheric lenses are known for their optimal performance but the expense of fabricating them has inhibited their use. LightPath's glass molding technology has enabled high volume production of aspheric optics while maintaining the highest quality at an affordable price. Because molding is the most consistent and economical way to produce aspheres in large volumes, LightPath has perfected this method to offer the most precise aspheric lens available. LightPath offers standard and custom-made lenses, all designed by our expert optical design engineers.

Geltech Asphere Performance Parameters					
Lens Code	Focal Length (mm)	Numerical Aperture	Outer Diameter (mm)	Working Distance (mm)	Page
355104	0.3	0.65	1.6	0.150 / .975	8
355631	0.39	0.55 / 0.13	1.20 x 1.20	0.284 / 1.902	8
355070	0.43	0.06 / 0.66	1.20 x 1.20	5.00 / 0.270	8
355485	0.55	0.50 / 0.10	1.00	0.30 / 3.030	8
355487	0.55	0.50 / 0.11	1.00	0.276 / 2.940	8
355465	0.55	0.50 / 0.10	1.0 x 1.0	0.250 / 2.874	8
355536	0.60	0.60	1.24	0.22	8
355880	0.70	0.60	2.50	0.33	8
355840	0.75	0.47	3.00	0.43	8
355915	0.80	0.12 / 0.50	1.30	3.931 / 0.669	8
355960	1.00	0.62	1.824	0.24	9
355198	1.05	0.5	1.4	.610	9
355200	1.14	0.43 / 0.124	2.40	4.81	9
355201	1.14	0.124 / 0.430	4.93	1.129 / 4.809	9
354450	1.16	0.30 / 0.30	1.80	1.67 / 1.67	9
357786	1.41	0.502	2.00	1.20	9
356785	1.42	0.62	2.75	0.86	9
354710	1.49	0.53	2.65	1.02	9

Geltech Asphere Performance Parameters					
Lens Code	Focal Length (mm)	Numerical Aperture	Outer Diameter (mm)	Working Distance (mm)	Page
355957	1.8	0.4	3.0	1.1	9
355755	1.94	0.15 / 0.15	1.70	3.570 / 3.570	10
355150	2.00	0.5	3.00	1.4	10
355151	2.00	0.504	3.00	1.029	10
355410	2.51	0.20	1.805	1.84	10
355615	2.51	0.201	2.05	1.731	10
355945	2.51	0.317	3.00	1.761	10
356300	2.54	0.66	4.00	1.55	10
355160	2.73	0.55	4.00	2.37	10
355390	2.75	0.55	4.50	2.16	10
355440	2.76	0.52 / 0.26	4.70	7.090 / 2.713	10
355392	2.80	0.6	4.00	1.5	11
355660	2.976	0.52	4.00	1.56	11
354330	3.10	0.7	6.325	1.8	11
355330	3.10	0.77	6.325	1.59	11
353515	3.50	0.4	3.00	2.3	11
355545	3.50	0.38	3.50	2.3	11
355970	3.70	0.21	1.80	3.030	11

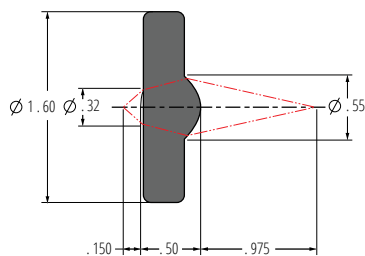
Geltech Asphere Performance Parameters

Lens Code	Focal Length (mm)	Numerical Aperture	Outer Diameter (mm)	Working Distance (mm)	Page
355970	3.70	0.21	1.80	3.030	11
357775	4.00	0.6	6.325	2.4	11
357610	4.00	0.616	6.325	2.691	11
357765	4.00	0.61	6.325	2.37	11
355940	4.02	0.17	3.00	3.37	12
354340	4.03	0.64	6.325	2.68	12
355625	4.13	0.55	5.585	2.2	12
355022	4.47	0.47	5.42	3.08	12
354350	4.50	0.4	4.70	2.2	12
354996	4.50	0.30	3.00	3.46	12
355230	4.50	0.55	6.325	3.08	12
354453	4.60	0.5	6.00	2.7	12
354430	5.00	0.15	2.00	4.37	12
354105	5.50	0.6	7.20	3.7	12
354130	6.00	0.21	3.00	4.90	13
354550	6.10	0.18	2.79	4.87	13
354171	6.20	0.30	4.70	4.10	13
355110	6.20	0.4	7.20	3.5	13
354525	6.70	0.44	6.650	4.9	13
354115	6.80	0.5	9.20	4.3	13

Geltech Asphere Performance Parameters

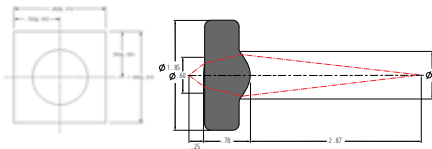
Lens Code	Focal Length (mm)	Numerical Aperture	Outer Diameter (mm)	Working Distance (mm)	Page
355375	7.50	0.3	6.51	5.8	13
354240	8.00	0.5	9.936	5.9	13
354060	9.60	0.30	6.325	8.13	13
354306	9.90	0.3	6.335	8.4	13
354125	10.00	0.5	11.00	7.8	14
355561	10.00	0.6	15.00	7.0	14
354220	11.00	0.3	7.20	7.9	14
354061	11.00	0.24	6.325	9.56	14
354062	11.00	0.24	6.00	9.66	14
354064	11.00	0.24	6.00	9.3	14
355397	11.00	0.3	7.20	10.0	14
354058	12.00	0.22	6.325	10.57	14
354057	13.00	0.20	6.325	11.58	14
354560	13.86	0.18	6.325	12.11	14
354059	14.00	0.19	6.325	12.63	15
354120	15.04	0.15	4.985	13.19	15
354260	15.29	0.16	6.50	13.98	15
354280	18.40	0.15	6.50	17.11	15
354850	22.00	0.13	6.325	20.41	15

# PRODUCT DESCRIPTION



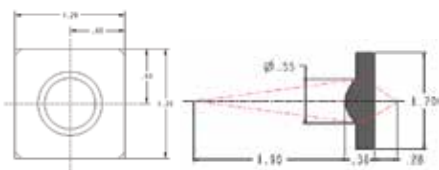
## 355104

Design Wavelength	1300
Focal Length	0.3
Numerical Aperture	0.65
Clear Aperture	0.29/0.48



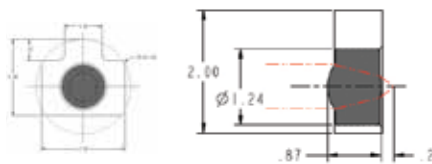
## 355465

Design Wavelength	1310
Focal Length	0.55
Numerical Aperture	0.50/0.10
Clear Aperture	0.40/0.70



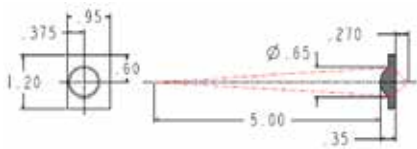
## 355631

Design Wavelength	1310
Focal Length	0.39
Numerical Aperture	0.55/0.13
Clear Aperture	0.37/0.53



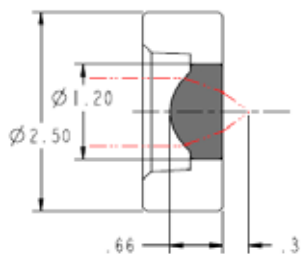
## 355536

Design Wavelength	1310
Focal Length	0.60
Numerical Aperture	0.60
Clear Aperture	0.72/0.35



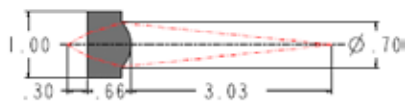
## 355070

Design Wavelength	1550
Focal Length	0.43
Numerical Aperture	0.06/0.66
Clear Aperture	0.62/0.47



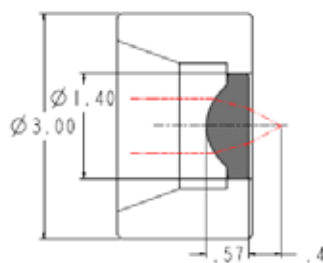
## 355880

Design Wavelength	1550
Focal Length	0.70
Numerical Aperture	0.60
Clear Aperture	0.84/0.49



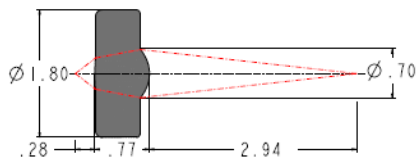
## 355485

Design Wavelength	1550
Focal Length	0.55
Numerical Aperture	0.50/0.10
Clear Aperture	0.35/0.66



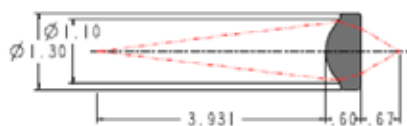
## 355840

Design Wavelength	940
Focal Length	0.75
Numerical Aperture	0.47
Clear Aperture	0.71/0.46



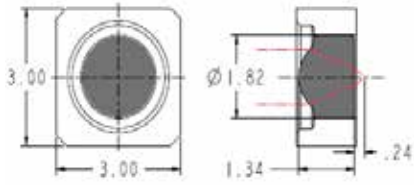
## 355487

Design Wavelength	1500
Focal Length	0.55
Numerical Aperture	0.50/0.11
Clear Aperture	0.35/0.68



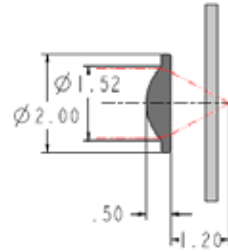
## 355915

Design Wavelength	1550
Focal Length	0.80
Numerical Aperture	0.12/0.50
Clear Aperture	1.00/0.77



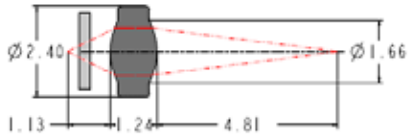
### 355960

Design Wavelength	1500
Focal Length	1.00
Numerical Aperture	0.62
Clear Aperture	1.20/0.39



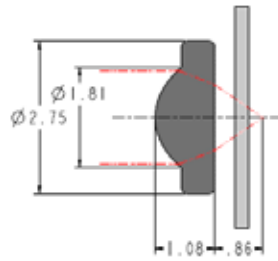
### 357786

Design Wavelength	488
Focal Length	1.41
Numerical Aperture	0.502
Clear Aperture	1.42/1.28



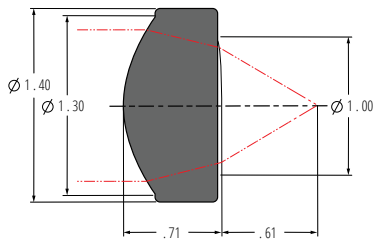
### 355200

Design Wavelength	1300
Focal Length	1.14
Numerical Aperture	0.43/0.124
Clear Aperture	1.24/1.24



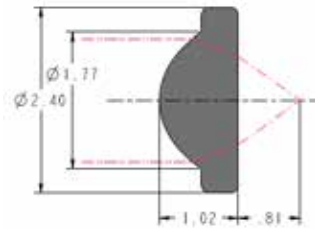
### 356785

Design Wavelength	488
Focal Length	1.42
Numerical Aperture	0.62
Clear Aperture	1.70/1.18



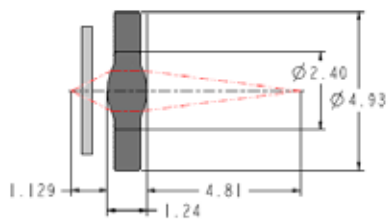
### 355198

Design Wavelength	1550
Focal Length	1.05
Numerical Aperture	0.5
Clear Aperture	1.10/0.84



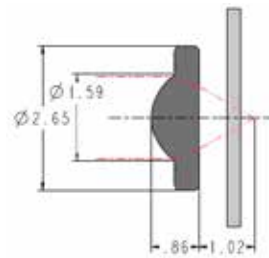
### 354140

Design Wavelength	780
Focal Length	1.45
Numerical Aperture	0.58
Clear Aperture	1.60/1.14



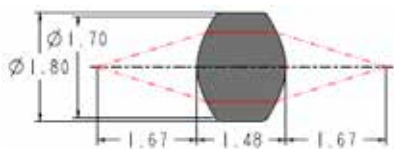
### 355201

Design Wavelength	1300
Focal Length	1.14
Numerical Aperture	0.124
Clear Aperture	1.24/1.24



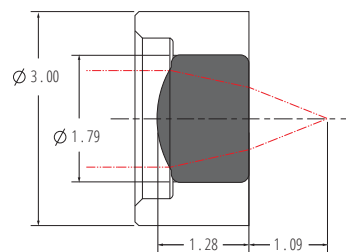
### 354710

Design Wavelength	1550
Focal Length	1.49
Numerical Aperture	0.53
Clear Aperture	1.50/1.15



### 354450

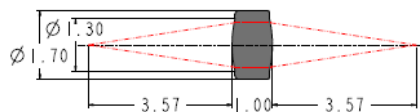
Design Wavelength	980
Focal Length	1.16
Numerical Aperture	0.30
Clear Aperture	1.14/1.14



### 355957

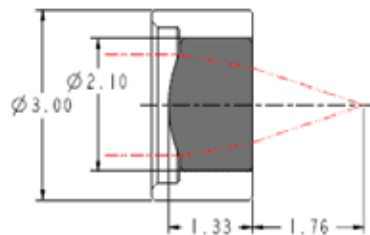
Design Wavelength	1550
Focal Length	1.8
Numerical Aperture	0.4
Clear Aperture	1.35/0.87

# PRODUCT DESCRIPTION



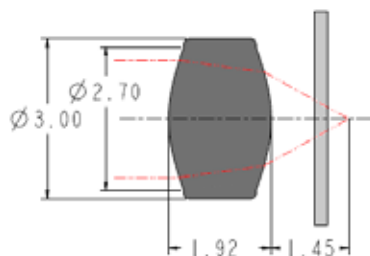
## 355755

Design Wavelength	1577
Focal Length	1.94
Numerical Aperture	0.15/0.15
Clear Aperture	1.10/1.10



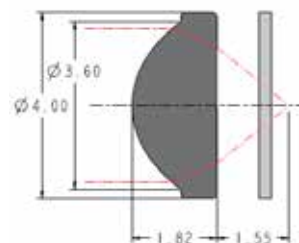
## 355945

Design Wavelength	1550
Focal Length	2.51
Numerical Aperture	0.317
Clear Aperture	1.60/1.18



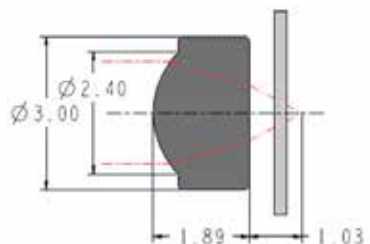
## 355150

Design Wavelength	780
Focal Length	2.00
Numerical Aperture	0.5
Clear Aperture	2.20/2.20



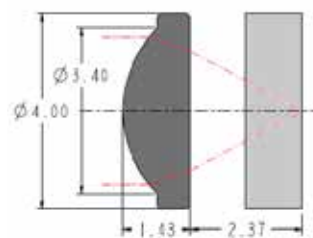
## 356300

Design Wavelength	405
Focal Length	2.54
Numerical Aperture	0.66
Clear Aperture	3.30/2.50



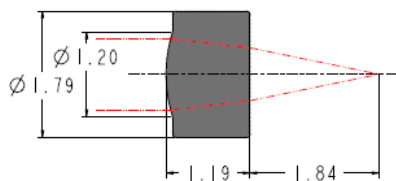
## 355151

Design Wavelength	780
Focal Length	2.00
Numerical Aperture	0.504
Clear Aperture	2.00/1.09



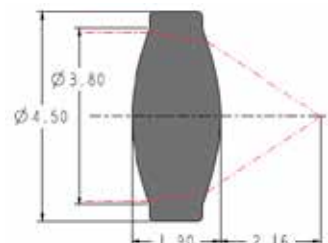
## 355160

Design Wavelength	780
Focal Length	2.73
Numerical Aperture	0.55
Clear Aperture	3.00/2.44



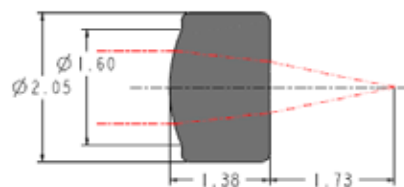
## 355410

Design Wavelength	1550
Focal Length	2.51
Numerical Aperture	0.20
Clear Aperture	1.01/0.75



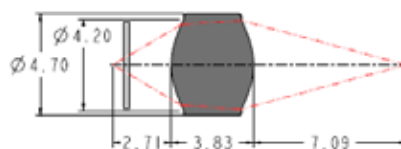
## 355390

Design Wavelength	830
Focal Length	2.75
Numerical Aperture	0.55
Clear Aperture	3.60/3.24



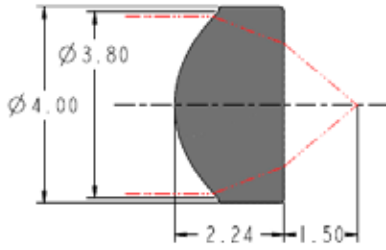
## 355615

Design Wavelength	1550
Focal Length	2.51
Numerical Aperture	0.201
Clear Aperture	1.01/0.71



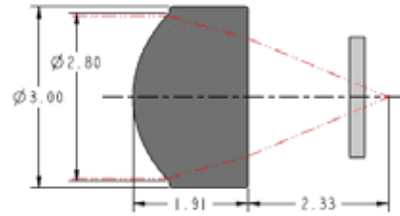
## 355440

Design Wavelength	980
Focal Length	2.76
Numerical Aperture	0.52/0.26
Clear Aperture	4.12/4.12



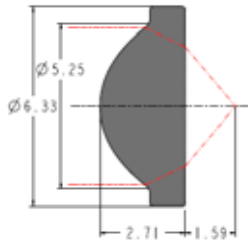
### 355392

Design Wavelength	830
Focal Length	2.80
Numerical Aperture	0.6
Clear Aperture	3.60/2.50



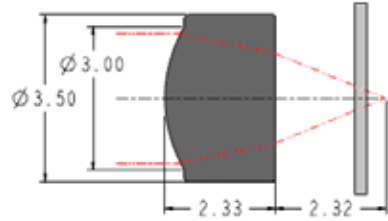
### 35515

Design Wavelength	515
Focal Length	3.50
Numerical Aperture	0.4
Clear Aperture	2.70/1.95



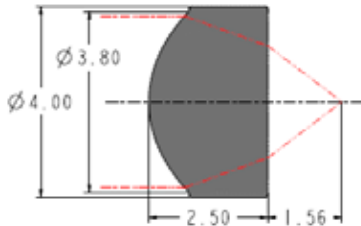
### 355330

Design Wavelength	830
Focal Length	3.10
Numerical Aperture	0.77
Clear Aperture	5.00/3.79



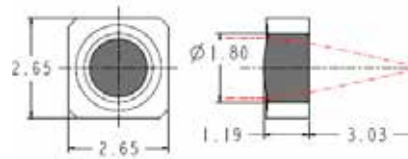
### 355545

Design Wavelength	515
Focal Length	3.50
Numerical Aperture	0.38
Clear Aperture	2.71/1.88



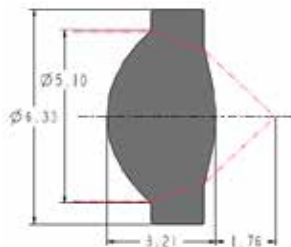
### 355660

Design Wavelength	1550
Focal Length	2.976
Numerical Aperture	0.52
Clear Aperture	3.60/2.35



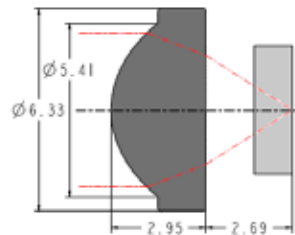
### 355970

Design Wavelength	1550
Focal Length	3.70
Numerical Aperture	0.21
Clear Aperture	1.56/1.30



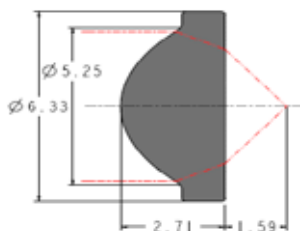
### 354330

Design Wavelength	830
Focal Length	3.10
Numerical Aperture	0.7
Clear Aperture	5.00/3.84



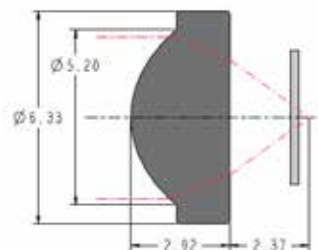
### 357610

Design Wavelength	410
Focal Length	4.00
Numerical Aperture	0.616
Clear Aperture	4.80/3.39



### 355330

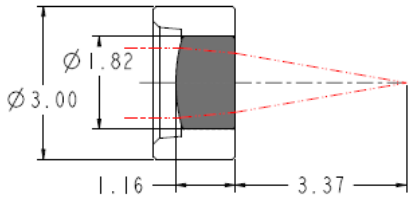
Design Wavelength	830
Focal Length	3.10
Numerical Aperture	0.77
Clear Aperture	5.00/3.61



### 357765

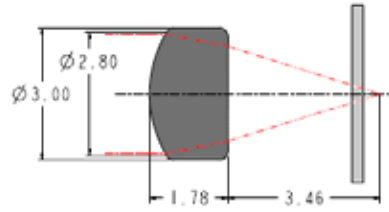
Design Wavelength	488
Focal Length	4.00
Numerical Aperture	0.61
Clear Aperture	4.80/3.43

# PRODUCT DESCRIPTION



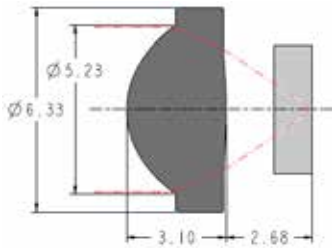
## 355940

Design Wavelength	1550
Focal Length	4.02
Numerical Aperture	0.17
Clear Aperture	1.37/1.16



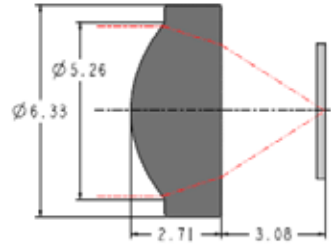
## 354996

Design Wavelength	634
Focal Length	4.50
Numerical Aperture	0.30
Clear Aperture	2.70/2.15



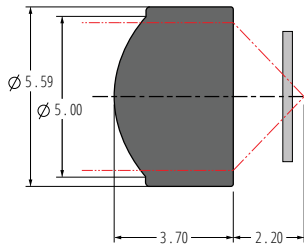
## 354340

Design Wavelength	685
Focal Length	4.03
Numerical Aperture	0.64
Clear Aperture	5.10/3.77



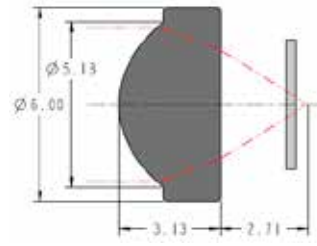
## 355230

Design Wavelength	780
Focal Length	4.50
Numerical Aperture	0.55
Clear Aperture	5.07/3.93



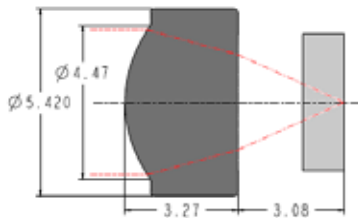
## 355625

Design Wavelength	447
Focal Length	4.13
Numerical Aperture	0.55
Clear Aperture	4.60/4.60



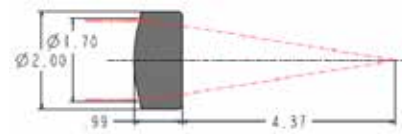
## 354453

Design Wavelength	655
Focal Length	4.60
Numerical Aperture	0.5
Clear Aperture	4.80/3.38



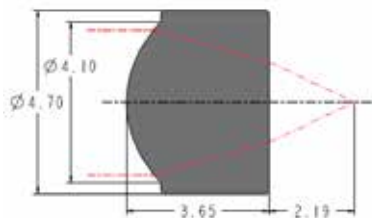
## 355022

Design Wavelength	780
Focal Length	4.47
Numerical Aperture	0.47
Clear Aperture	4.20/2.77



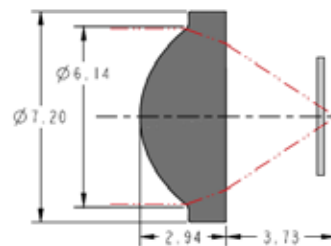
## 354430

Design Wavelength	1550
Focal Length	5.00
Numerical Aperture	0.15
Clear Aperture	1.60/1.40



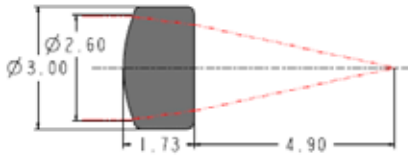
## 354350

Design Wavelength	980
Focal Length	4.50
Numerical Aperture	0.4
Clear Aperture	3.70/2.05



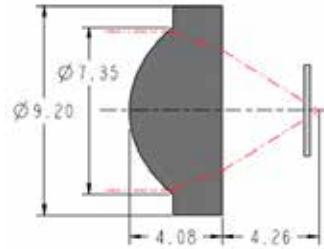
## 354105

Design Wavelength	633
Focal Length	5.50
Numerical Aperture	0.6
Clear Aperture	6.00/4.96



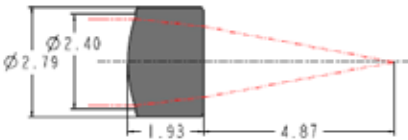
### 354130

Design Wavelength	1550
Focal Length	6.00
Numerical Aperture	0.21
Clear Aperture	2.50/2.10



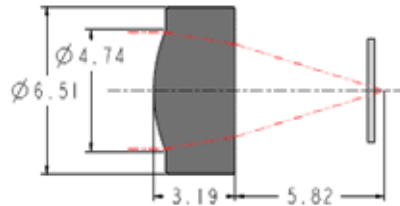
### 354115

Design Wavelength	633
Focal Length	6.80
Numerical Aperture	0.5
Clear Aperture	7.00/5.30



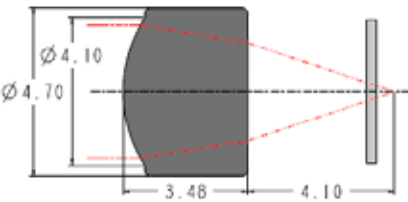
### 354550

Design Wavelength	1550
Focal Length	6.10
Numerical Aperture	0.18
Clear Aperture	2.20/1.79



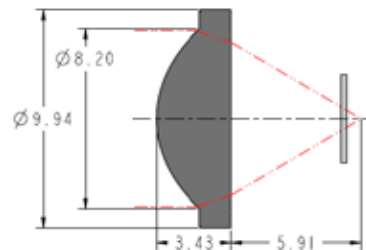
### 355375

Design Wavelength	780
Focal Length	7.50
Numerical Aperture	0.3
Clear Aperture	4.54/3.61



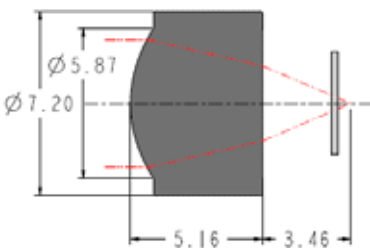
### 354171

Design Wavelength	633
Focal Length	6.20
Numerical Aperture	0.30
Clear Aperture	3.70/2.72



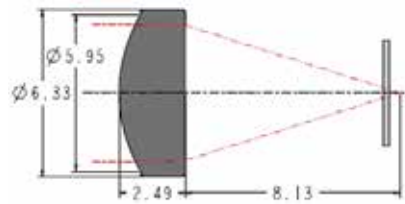
### 354240

Design Wavelength	780
Focal Length	8.00
Numerical Aperture	0.5
Clear Aperture	8.00/6.94



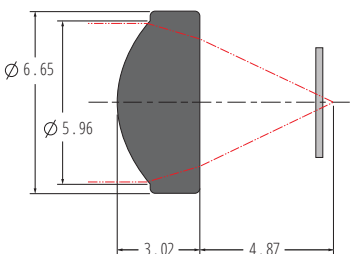
### 355110

Design Wavelength	780
Focal Length	6.20
Numerical Aperture	0.4
Clear Aperture	5.00/2.93



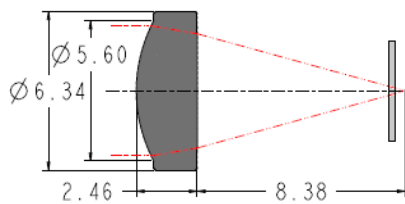
### 354060

Design Wavelength	633
Focal Length	9.60
Numerical Aperture	0.30
Clear Aperture	5.20/5.13



### 354525

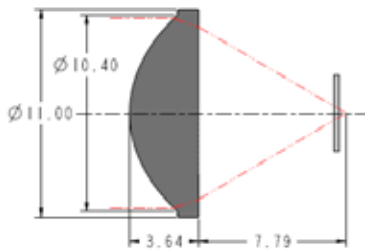
Design Wavelength	515
Focal Length	6.70
Numerical Aperture	0.44
Clear Aperture	5.75/4.66



### 354306

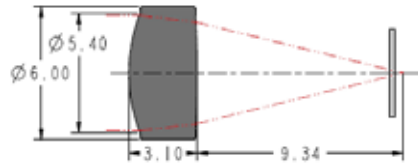
Design Wavelength	650
Focal Length	9.90
Numerical Aperture	0.3
Clear Aperture	5.20/4.57

# PRODUCT DESCRIPTION



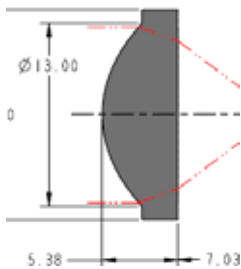
## 354125

Design Wavelength	633
Focal Length	10.00
Numerical Aperture	0.5
Clear Aperture	10.00/9.12



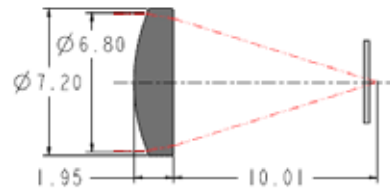
## 354064

Design Wavelength	633
Focal Length	11.00
Numerical Aperture	0.24
Clear Aperture	5.20/4.59



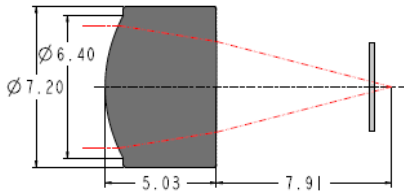
## 355561

Design Wavelength	850
Focal Length	10.00
Numerical Aperture	0.6
Clear Aperture	12.50/10.53



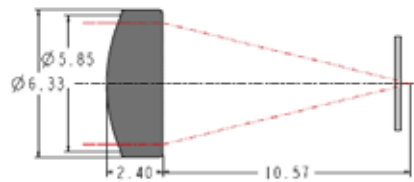
## 355397

Design Wavelength	670
Focal Length	11.00
Numerical Aperture	0.3
Clear Aperture	6.68/6.24



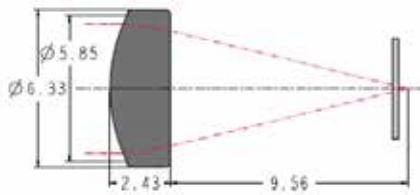
## 354220

Design Wavelength	633
Focal Length	11.00
Numerical Aperture	0.3
Clear Aperture	5.50/4.07



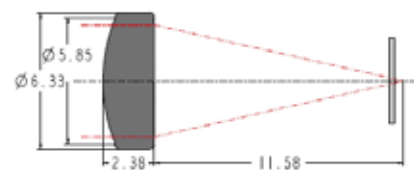
## 354058

Design Wavelength	633
Focal Length	12.00
Numerical Aperture	0.22
Clear Aperture	5.20/5.20



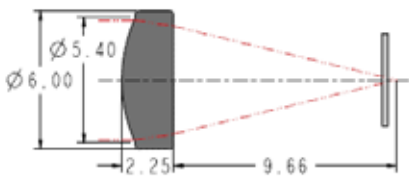
## 354061

Design Wavelength	633
Focal Length	11.00
Numerical Aperture	0.24
Clear Aperture	5.20/4.63



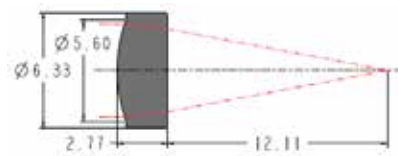
## 354057

Design Wavelength	633
Focal Length	13.00
Numerical Aperture	0.20
Clear Aperture	5.20/5.20



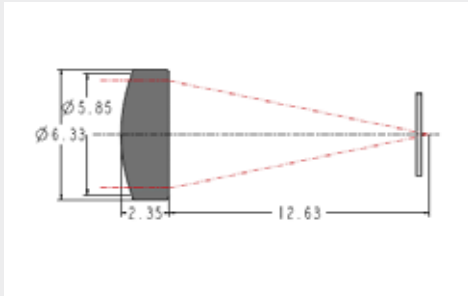
## 354062

Design Wavelength	633
Focal Length	11.00
Numerical Aperture	0.24
Clear Aperture	5.20/4.68

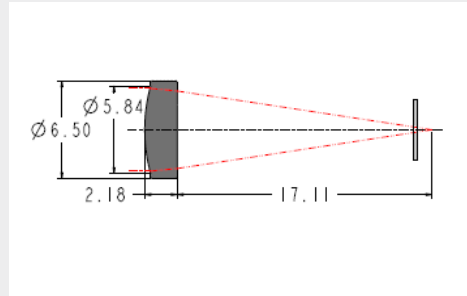


## 354560

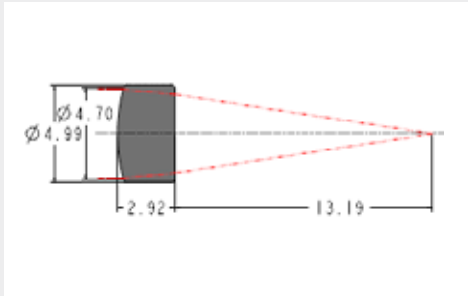
Design Wavelength	650
Focal Length	13.86
Numerical Aperture	0.18
Clear Aperture	5.10/4.54



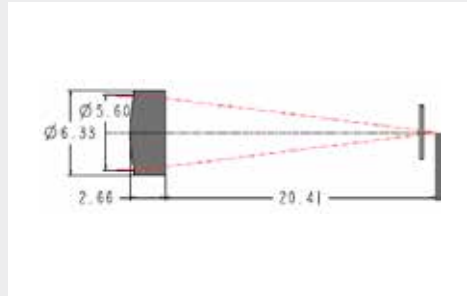
<b>354059</b>	
Design Wavelength	633
Focal Length	14.00
Numerical Aperture	0.19
Clear Aperture	5.20/5.20



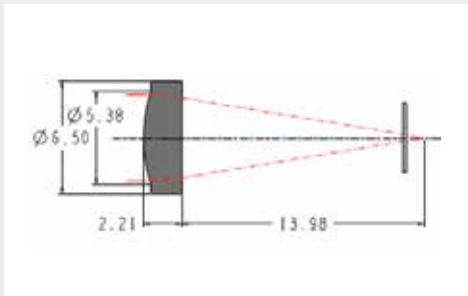
<b>354280</b>	
Design Wavelength	780
Focal Length	18.40
Numerical Aperture	0.15
Clear Aperture	5.50/5.15



<b>354120</b>	
Design Wavelength	670
Focal Length	15.04
Numerical Aperture	0.15
Clear Aperture	4.50/4.00



<b>354850</b>	
Design Wavelength	670
Focal Length	22.00
Numerical Aperture	0.13
Clear Aperture	5.50/5.13



<b>354260</b>	
Design Wavelength	780
Focal Length	15.29
Numerical Aperture	.016
Clear Aperture	5.00/4.61



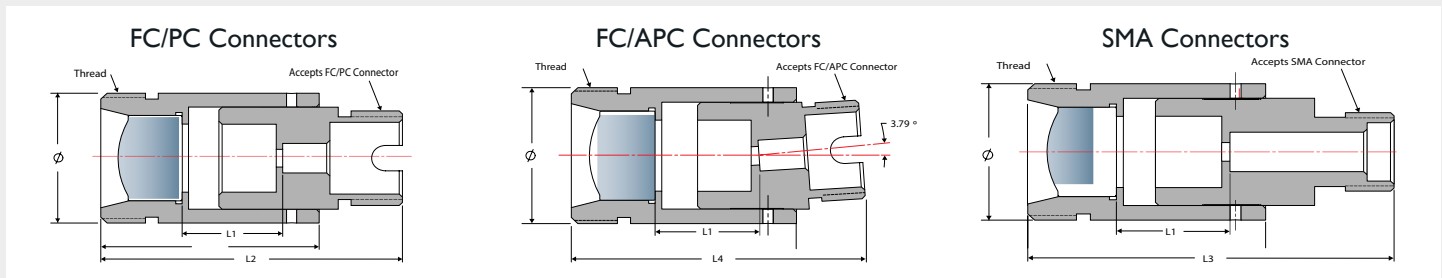
## Infrared Laser Collimation Lenses

Part Number	Design Wavelength	Numerical Aperture	Clear Aperture	Effective Focal Length	Outer Diameter	Working Distance	Center Thickness
390036	2.5μm	0.56	5.0mm	4.0mm	6.5mm	3.05mm	2.50mm
390042	2.5μm	0.23	10.0mm	19.04mm	12.5mm	16.63mm	5.00mm
390017	2.7μm	0.72	2.6mm	1.50mm	3.5mm	1.24mm	1.10mm
390028	4.1μm	0.56	7.6mm	5.95mm	8.0mm	5.0mm	2.50mm
390029	4.2μm	0.86	2.5mm	0.91mm	3.0mm	0.66mm	0.90mm
390093	7.8μm	0.71	5.0mm	3.0mm	6.5mm	2.35mm	2.62mm
390010	9.2μm	0.83	3.0mm	1.47mm	4.5mm	0.63mm	2.18mm
390037	9.2μm	0.85	4.0mm	1.87mm	5.5mm	0.72mm	3.00mm

# CONNECTORIZED ASPHERIC FIBER OPTIC COLLIMATORS

## MOLDED ASPHERIC LENSES PRE-ALIGNED FOR USE WITH FIBER PATCH CORDS

LightPath's connectorized collimators are available with FC/PC, FC/APC, or SMA fiber optic connectors. Each collimator is individually aligned and tested for the specified wavelength, and will offer excellent performance throughout the entire range of their AR coatings. Standard design assemblies are available for our most popular lens types, but any asphere in our catalog can be mounted into a custom assembly of your choice. Please contact LightPath sales for more information.



For all Connectorized Collimators, Pointing Accuracy =  $0.5^\circ$  and Waist Position = Infinity  
 Connectorized Collimators can also be ordered as an unaligned kit for custom wavelength alignment

Part Number	Wavelength (nm)	Beam $\phi$ (mm)*	AR Coating	Thread $\phi$	$\phi$ (mm)
355110 - (FCPC/FCAPC/SMA) - 543	543	1.2	A	M11 x 0.5-6g	11
355110 - (FCPC/FCAPC/SMA) - 633	633	1.2	B	M11 x 0.5-6g	11
355110 - (FCPC/FCAPC/SMA) - 780	780	1.2	B	M11 x 0.5-6g	11
355110 - (FCPC/FCAPC/SMA) - 1064	1064	1.4	C	M11 x 0.5-6g	11
355110 - (FCPC/FCAPC/SMA) - 1310	1310	1.1	C	M11 x 0.5-6g	11
355110 - (FCPC/FCAPC/SMA) - 1550	1550	1.2	C	M11 x 0.5-6g	11
355110 - (FCPC/FCAPC/SMA) -Y - KIT			A, B, or C	M11 x 0.5-6g	11
354220 - (FCPC/FCAPC/SMA) - 543	543	2.2	A	M11 x 0.5-6g	11
354220 - (FCPC/FCAPC/SMA) - 633	633	2.1	B	M11 x 0.5-6g	11
354220 - (FCPC/FCAPC/SMA) - 780	780	2.2	B	M11 x 0.5-6g	11
354220 - (FCPC/FCAPC/SMA) - 1064	1064	2.4	C	M11 x 0.5-6g	11
354220 - (FCPC/FCAPC/SMA) - 1310	1310	2.0	C	M11 x 0.5-6g	11
354220 - (FCPC/FCAPC/SMA) - 1550	1550	2.1	C	M11 x 0.5-6g	11
354220 - (FCPC/FCAPC/SMA) -Y - KIT			A, B, or C	M11 x 0.5-6g	11
355230 - (FCPC/FCAPC/SMA) - 543	543	0.9	A	M11 x 0.5-6g	11
355230 - (FCPC/FCAPC/SMA) - 633	633	0.8	B	M11 x 0.5-6g	11
355230 - (FCPC/FCAPC/SMA) - 780	780	0.9	B	M11 x 0.5-6g	11
355230 - (FCPC/FCAPC/SMA) - 1064	1064	1.0	C	M11 x 0.5-6g	11
355230 - (FCPC/FCAPC/SMA) - 1310	1310	0.8	C	M11 x 0.5-6g	11
355230 - (FCPC/FCAPC/SMA) - 1550	1550	0.9	C	M11 x 0.5-6g	11
355230 - (FCPC/FCAPC/SMA) -Y KIT			A, B, or C	M11 x 0.5-6g	11
354240 - (FCPC/FCAPC/SMA) - 543	543	1.6	A	M12 x 0.5-6g	12
354240 - (FCPC/FCAPC/SMA) - 633	633	1.5	B	M12 x 0.5-6g	12
354240 - (FCPC/FCAPC/SMA) - 780	780	1.6	B	M12 x 0.5-6g	12
354240 - (FCPC/FCAPC/SMA) - 1064	1064	1.8	C	M12 x 0.5-6g	12
354240 - (FCPC/FCAPC/SMA) - 1310	1310	1.5	C	M12 x 0.5-6g	12
354240 - (FCPC/FCAPC/SMA) - 1550	1550	1.5	C	M12 x 0.5-6g	12
354240 - (FCPC/FCAPC/SMA) -Y - KIT			A, B, or C	M12 x 0.5-6g	12
354260 - (FCPC/FCAPC/SMA) - 543	543	3.0	A	M11 x 0.5-6g	11
354260 - (FCPC/FCAPC/SMA) - 633	633	2.8	B	M11 x 0.5-6g	11
354260 - (FCPC/FCAPC/SMA) - 780	780	3.1	B	M11 x 0.5-6g	11
354260 - (FCPC/FCAPC/SMA) - 1064	1064	3.3	C	M11 x 0.5-6g	11
354260 - (FCPC/FCAPC/SMA) - 1310	1310	2.8	C	M11 x 0.5-6g	11
354260 - (FCPC/FCAPC/SMA) - 1550	1550	2.9	C	M11 x 0.5-6g	11
354260 - (FCPC/FCAPC/SMA) -Y - KIT			A, B, or C	M11 x 0.5-6g	11
357775 - (FCPC/FCAPC/SMA) - 405	405	0.7	UVA	M11 x 0.5-6g	11
357775 - (FCPC/FCAPC/SMA) -Y - KIT			UVA	M11 x 0.5-6g	11

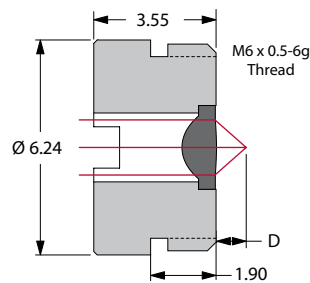
## MOLDED ASPHERIC LENSES MOUNTED FOR EASY ASSEMBLY

Part Number*	Holder Type	EFL (mm)	NA
357775Y-00-MT	MT9	4.02	0.6
357765Y-00-MT	MT9	4.00	0.61
357610Y-00-MT	MT9	4.00	0.62
355397Y-00-MT	MT9	11.00	0.3
355375Y-00-MT	MT9	7.50	0.3
355330Y-00-MT	MT9	3.10	0.77
355230Y-00-MT	MT9	4.51	0.55
355110Y-00-MT	MT9	6.24	0.4
354850Y-00-MT	MT9	22.00	0.13
354560Y-00-MT	MT9	13.86	0.18
354453Y-00-MT	MT9	4.6	0.55
354340Y-00-MT	MT9	4.03	0.64
354306Y-00-MT	MT9	9.85	0.27
354280Y-00-MT	MT9	18.4	0.15
354260Y-00-MT	MT9	15.29	0.16
354220Y-00-MT	MT9	11.00	0.25
354105Y-00-MT	MT9	5.50	0.56
354064Y-00-MT	MT9	11.00	0.24
354062Y-00-MT	MT9	11.00	0.24
354061Y-00-MT	MT9	11.00	0.24
354060Y-00-MT	MT9	9.60	0.27
354059Y-00-MT	MT9	14.00	0.19
354058Y-00-MT	MT9	12.00	0.22
354057Y-00-MT	MT9	13.00	0.2
354525Y-00-MT	MT9	6.69	0.45
356300Y-00-MT	MT8	2.54	0.66
355660Y-00-MT	MT8	2.97	0.6
355440Y-00-MT	MT8	2.76	0.52
355392Y-00-MT	MT8	2.75	0.64
355390Y-00-MT	MT8	2.75	0.68
355160Y-00-MT	MT8	2.73	0.55
355022Y-00-MT	MT8	4.47	0.47
354350Y-00-MT	MT8	4.50	0.43
357786Y-00-MT	MT6B	1.41	0.5
356785Y-00-MT	MT6B	1.42	0.62
355200Y-00-MT	MT6B	1.14	0.43
355151Y-00-MT	MT6B	2.00	0.5
355150Y-00-MT	MT6B	2.00	0.51
354996Y-00-MT	MT6B	4.50	0.3
354710Y-00-MT	MT6B	1.49	0.53
354550Y-00-MT	MT6B	6.10	0.18
354430Y-00-MT	MT6B	5.00	0.15
353515Y-00-MT	MT6B	3.52	0.4
354140Y-00-MT	MT6A	1.45	0.58
354115Y-00-MT	MT12	6.75	0.54
354240Y-00-MT	MT12	8.00	0.5

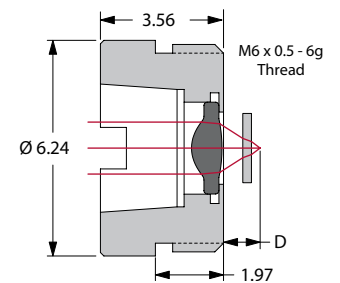


- Cost-effective solution for mounting Geltech aspheres
- Easy to handle assembly
- Durable stainless steel housing
- Threaded extension for easy mounting

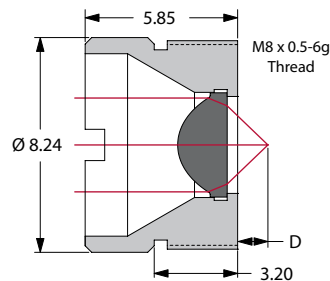
Lens Holder MT6A



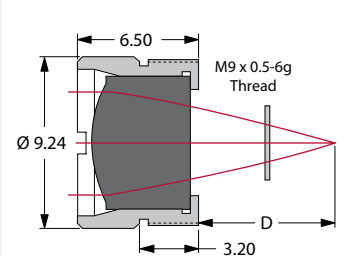
Lens Holder MT6B



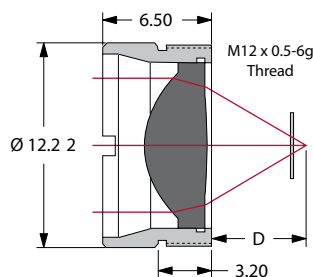
Lens Holder MT8



Lens Holder MT9



Lens Holder MT12



**DID YOU KNOW?**

There are a variety of custom coatings available.

\* "Y" in the Part Number, is a placeholder for the coating type that the customer selects.

# STANDARD GLASS TYPES

## OPTIMUM PERFORMANCE WITH OPTIMUM LENSES

Lens Code	Glass Type	Refractive Index, $n_d$	Abbé Number, $v_d$	CTE	dn/dT	Equivalent Glasses	RoHS Compliance
352xxx	ECO-550	1.603	50.02	$11.62 \times 10^{-6}/^{\circ}\text{C}$	$2.39 \times 10^{-6}/^{\circ}\text{C}$	N/A	
353xxx	H-FK61	1.495	81.20	$13.8 \times 10^{-6}/^{\circ}\text{C}$	$-6.6 \times 10^{-6}/^{\circ}\text{C}$	Hoya-FCD1 & Ohara S-FPL51	
354xxx	D-ZK3	1.586	60.71	$7.6 \times 10^{-6}/^{\circ}\text{C}$	$3.2 \times 10^{-6}/^{\circ}\text{C}$	Hoya M-BACD5N & Ohara L-BAL35	
355xxx	D-ZLaF52La	1.806	40.79	$6.9 \times 10^{-6}/^{\circ}\text{C}$	$6.5 \times 10^{-6}/^{\circ}\text{C}$	Ohara L-LAH53, Hoya M-NBFD130, Sumita K-VC89	
356xxx	L-LAL12	1.674	55.00	$6.9 \times 10^{-6}/^{\circ}\text{C}$	$6.5 \times 10^{-6}/^{\circ}\text{C}$	CDGM D-Lak5	
357xxx	D-LaK6	1.690	52.65	$6.9 \times 10^{-6}/^{\circ}\text{C}$	$6.5 \times 10^{-6}/^{\circ}\text{C}$	Hoya M-LAC130 & Ohara L-LAL13	

### D-ZLaF52La → 355xxx Series of Lenses

This glass has a higher index of refraction than ECO-550 and is best suited for those applications that require a higher numerical aperture and need to maintain RoHS compliance.

### D-ZK3 → 354xxx Series of Lenses

This glass is best suited for those applications that require a low cost glass for higher volume manufacturing.

### ECO-550 → 352xxx Series of Lenses

ECO-550 is an environmentally friendly alternative to conventional moldable glasses.

### D-LaK6 → 357xxx Series of Lenses

These glasses have been selected for their outstanding UV & Blue transmission properties.

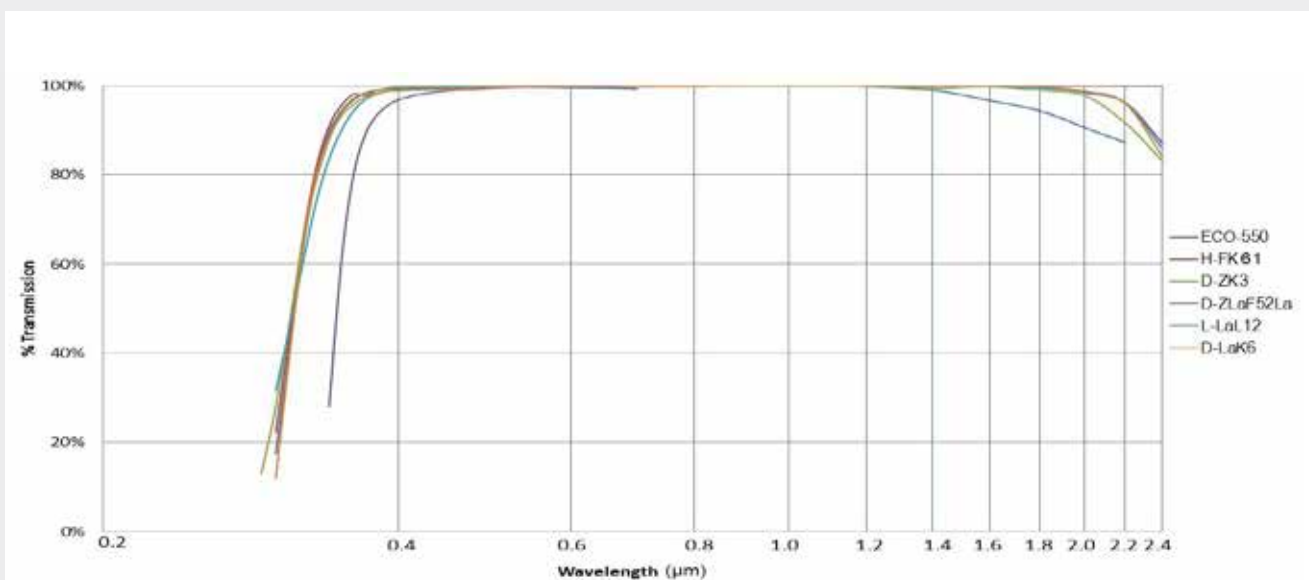
### H-FK61 → 353xxx Series of Lenses

These glasses have been selected for their outstanding UV & Green transmission properties.

### L-LAL12 → 356xxx Series of Lenses

## SPECIALTY GLASS TYPES

There are well over 200 available moldable glass types. LightPath focuses on a select few types in order to provide our customers the fastest lead times at the lowest cost. Our standard selections meet most of our customers' needs but sometimes that special application requires a unique glass. LightPath can provide these glasses, starting with material qualification.



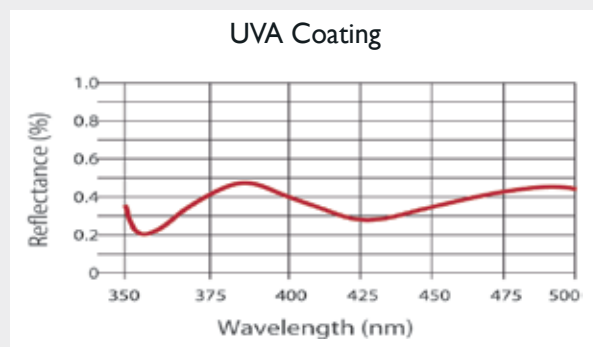
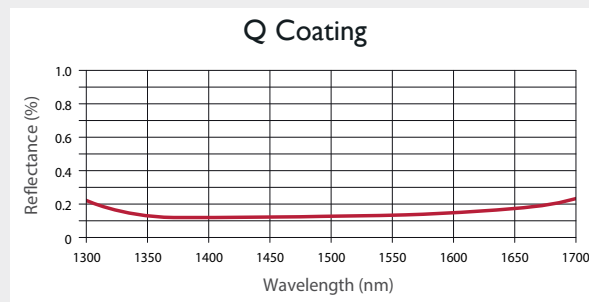
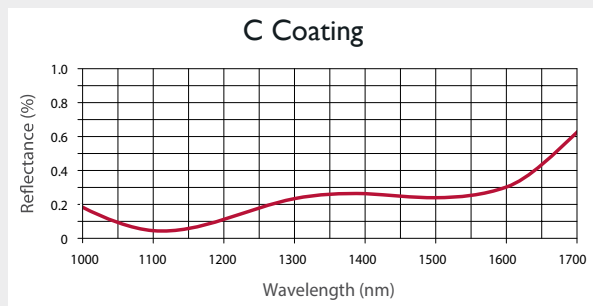
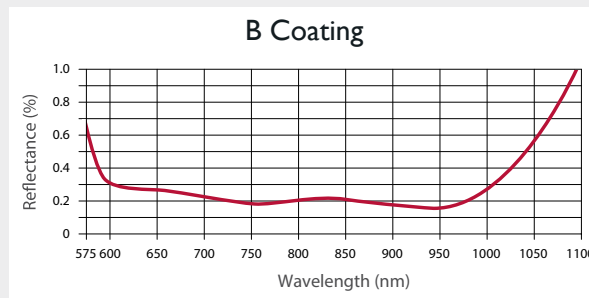
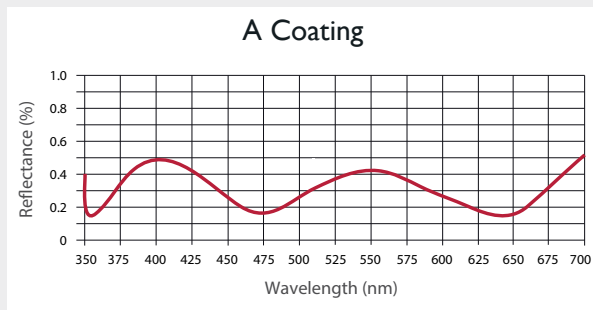
## STANDARD ANTI-REFLECTIVE COATINGS

LightPath offers a variety of multilayer broadband coatings to reduce the back reflection from a nominal 6% for uncoated lenses. The choice of which AR coating is appropriate depends on the type of glass the lens is made from and the wavelength at which the lens will be used.

Standard Coatings*			
Lens Series	Coating	$\lambda$ Range (nm)	Reflectivity
352xxx, 353xxx, 354xxx, 355xxx	MLBB-A	350 - 700	$R_{avg} \leq 0.50\%$
352xxx, 354xxx, 355xxx	MLBB-B	600 - 1050	$R_{max} < 1.00\%$
352xxx, 354xxx, 355xxx	MLBB-C	1050 - 1600	$R_{max} < 1.00\%$
355xxx	MLBB-Q	1300 - 1700	$R_{max} < 0.25\%$
356xxx, 357xxx	UVA	350 - 500	$R_{max} < 1.00\%$

\* LightPath's rigorous qualification process ensures all standard coatings will pass the abrasion and adhesion resistance requirements of ISO+9211-4-196.

## Typical Coating Curves



Contact LightPath today for your custom quote

1.800.472.3486 or +1.407.382.4003

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