



# Geltech Molded Aspheric Lenses

Leaders in  
aspheric  
optics and  
assemblies

# Geltech Precision Molded Aspheric Lenses

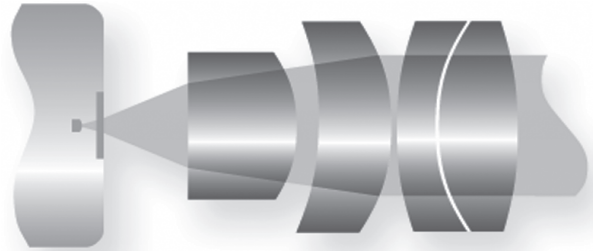
## MODERN LENSES FOR MODERN APPLICATIONS

For today's most sophisticated and compact laser systems, aspheres are the most powerful lenses for managing laser light. In these systems, spherical aberration is the most prevalent performance detractor. It arises from the use of spherical surfaces and artificial limits focusing and collimating accuracy.

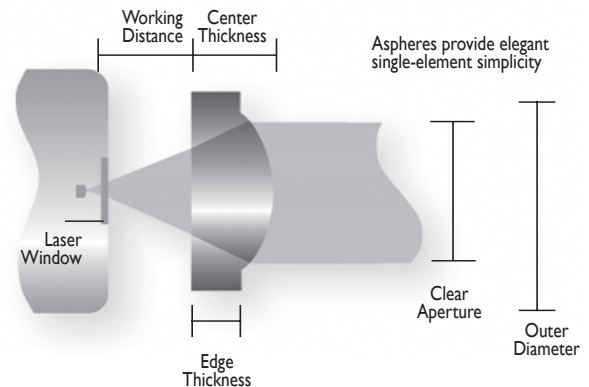
Although it has been known for centuries that spherical geometry is not optimal for refracting light, the expense of fabricating non-spherical (aspheric) surfaces has inhibited their use. With the breakthrough of LightPath's glass molding technology, this optimal lens geometry has become a reality.

Molded lenses are used in a variety of photonics products: barcode scanners, laser diode to fiber couplings, optical data storage, and medical lasers, to name a few. In many of these applications, the material of choice is optical glass because of its durability and performance stability over a wide environmental range. High power transmittance is also an added advantage.

### Spherical System



### Aspherical Lens



### Did you know...

That asphere optics from LightPath can actually improve system performance and lower overall cost?

The benefits of glass molding technology become apparent when traditional methods of grinding and polishing become cost-prohibitive. The direct molding process eliminates the need for any grinding or polishing, offering aspheric lenses at practical prices for system designers. Molding is the most consistent and economical way to produce aspheres in large volumes.

## GUARANTEED PERFORMANCE

LightPath's aspheric lenses are inspected and optically tested to ensure complete customer satisfaction. Visual cosmetic inspection for scratch/dig is performed on 100% of all lenses per MIL-PRF-13830B. Most lenses are guaranteed to pass 40/20 scratch/dig, but other inspection criteria, such as 60/40 or 20/10, can be provided upon request.

# Performance and Customization

## DIFFRACTION LIMITED PERFORMANCE

The primary optical specification is the root-mean-squared transmitted wavefront error (RMS WFE). It is measured on a phase shift interferometer at the wavelength of 632.8nm. Most of our lenses are guaranteed to be diffraction limited, which means the  $RMS\ WFE < 0.070 \lambda$  at the design wavelength.



Several of our standard lenses are available pre-mounted in metal holders. Using our unique Mold-In-Place (MIP) technology, we can mold the lens directly inside a steel holder, eliminating the need for adhesives. We can also epoxy our lenses into stainless steel or Kovar mounts so you can weld them directly into your system.

## NUMERICAL APERTURE

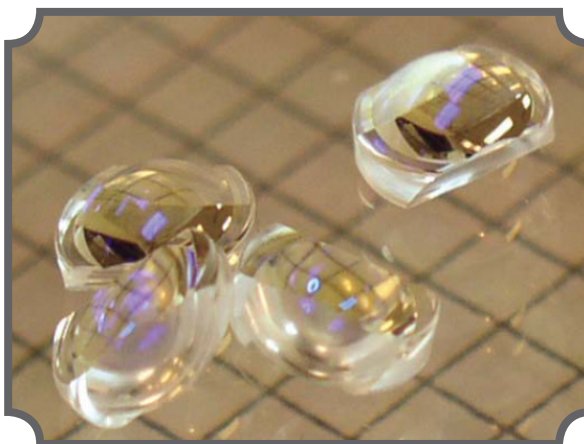
Our molded aspheric lenses are available with numerical apertures ranging from 0.15 up to 0.77. Lower numerical apertures are best when a large depth of focus is important or when you need nearly circular beams. Applications that would use a low numerical aperture include bar code scanners, surveying instruments, and small weapons sights. High numerical aperture lenses are important when you need the maximum light capture from a diode laser. 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 22mm in diameter, LightPath will be able to provide you with the perfect lens for your unique application.

## DIFFRACTIVE HYBRID LENSES

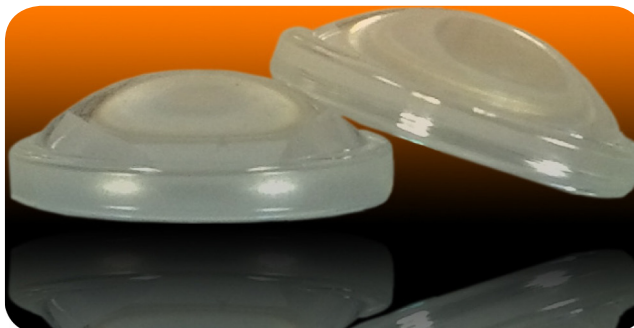
By combining a refractive aspheric lens with a diffractive feature on one surface, you can achieve sophisticated beam shaping of your laser light. You can also use diffractive hybrid lenses to make your system achromatic over a range of wavelengths. LightPath hybrid lenses are custom designed to each particular application.



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

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

- Wafer Lenses
- Anamorphic Lenses
- Molded-in-Place
  - Cylindrical Metal Holders
  - Square Holders
  - T-Holders
  - Custom Holders



# Glass Types and Coating Options

OPTIMUM PERFORMANCE WITH OPTIMUM LENSES

Lens Code	Glass Type	Refractive Index	Abbé Number	CTE	dn/dT	Equivalent Glasses	RoHS ✓ Compliance
352xxx	ECO-550	1.603	$v_d = 50.02$	$11.62 \times 10^{-6}/^{\circ}\text{C}$	$2.39 \times 10^{-6}/^{\circ}\text{C}$	N/A	✓
353xxx	H-FK61	1.495	$v_d = 81.20$	$13.8 \times 10^{-6}/^{\circ}\text{C}$	$-6.6 \times 10^{-6}/^{\circ}\text{C}$	Hoya-FCD1 & Ohara S-FPL51	✓
354xxx	D-ZK3	1.586	$v_d = 60.71$	$7.6 \times 10^{-6}/^{\circ}\text{C}$	$3.2 \times 10^{-6}/^{\circ}\text{C}$	Hoya M-BACD5N & Ohara L-BAL35	✓
355xxx	D-ZLaF52La	1.806	$v_d = 40.79$	$6.9 \times 10^{-6}/^{\circ}\text{C}$	$6.5 \times 10^{-6}/^{\circ}\text{C}$	Ohara L-LAH53, Hoya M-NBFD130, Sumita K-VC89	✓
356xxx	L-LaL12	1.674	$v_d = 55.00$	$6.9 \times 10^{-6}/^{\circ}\text{C}$	$6.5 \times 10^{-6}/^{\circ}\text{C}$	CDGM D-Lak5	✓
357xxx	D-LaK6	1.690	$v_d = 52.65$	$6.9 \times 10^{-6}/^{\circ}\text{C}$	$6.5 \times 10^{-6}/^{\circ}\text{C}$	Hoya M-LAC130 & Ohara L-LAL13	✓

## ECO-550 → 352xxx Series of Lenses

European and Japanese environmental regulations have restricted the use of lead and other hazardous substances in optical components. ECO-550 is an environmentally friendly alternative to conventional moldable glasses. It has similar properties to C-0550, but does not contain hazardous materials.

## H-FK61 → 353xxx Series of Lenses

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

## D-ZK3 → 354xxx Series of Lenses

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

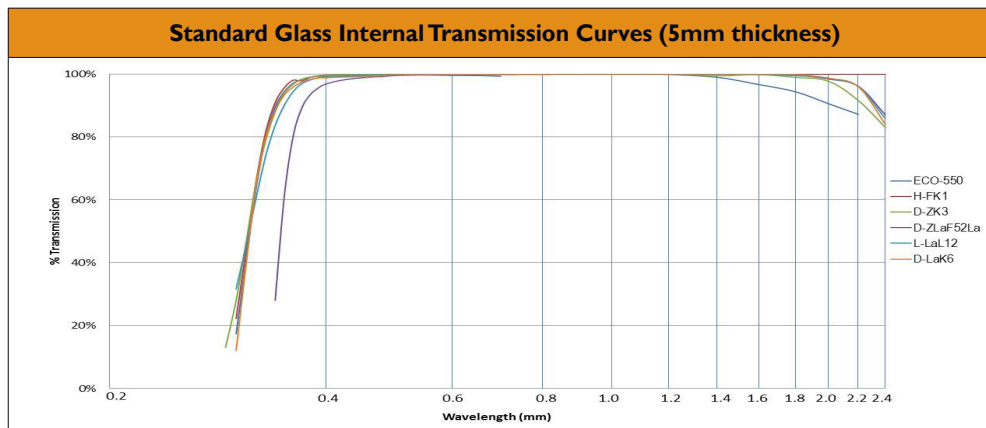
## D-ZLaF52La → 355xxx Series of Lenses

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.

## L-LaL12 → 356xxx Series of Lenses

## D-LaK6 → 357xxx Series of Lenses

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



## GELTECH ASPHERIC LENS COATINGS

### Standard Anti-Reflective Coatings

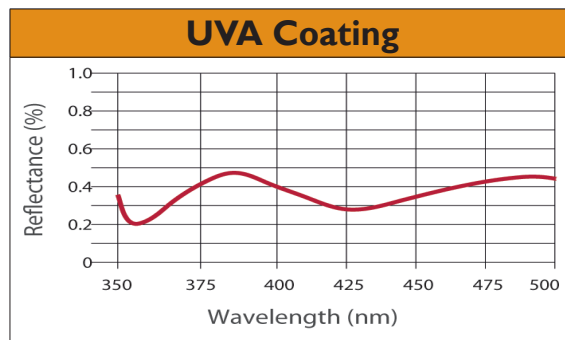
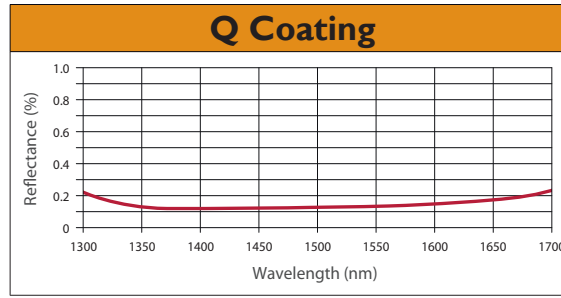
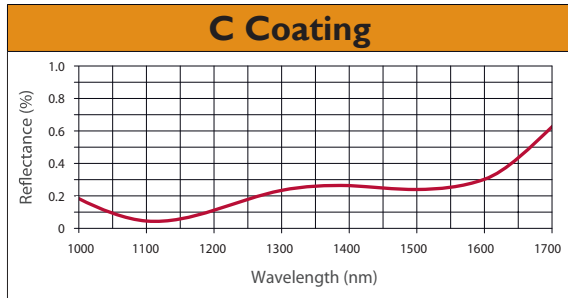
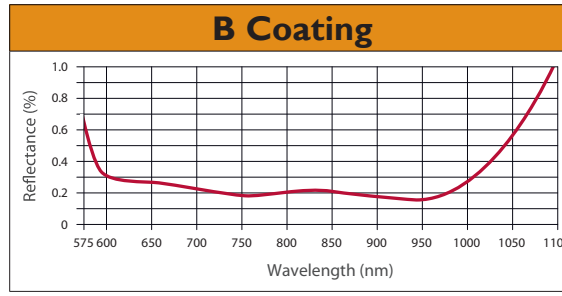
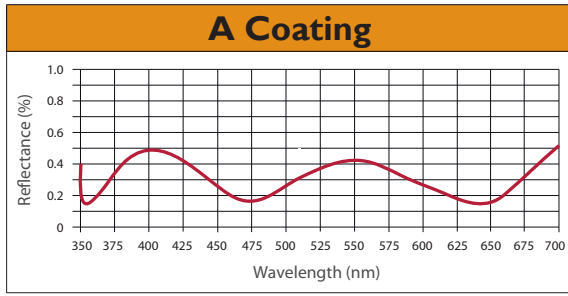
LightPath offers a variety of multilayer broadband coatings to reduce the back reflection from a nominal 6% for uncoated lenses. The choice of which AR coating is appropriate depends on the type of glass the lens is made from and the wavelength at which the lens will be used.

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



\* 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



## 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.

Contact us today for a quote on your custom design.

Manufacturing Tolerances	
Parameter	Typical Tolerance
Focal Length	± 1%
Center Thickness (CT)	± 0.025mm
Outer Diameter (OD)	± 0.015mm
Wedge (arcmin)	4
Power/Irregularity (fringes)	3/1
Surface Roughness	15nm
Surface Quality (scratch/dig)	40/20

# Choosing the Right Aspheric Lens

## DIODE COLLIMATION

One of the most common uses for aspheric lenses is in the collimation of edge emitting diode lasers. With over 70 standard lenses in LightPath's catalog to choose from, this can sometimes be a confusing task.

Due to the way that the laser cavity is constructed in edge emitting diode lasers, light is emitted in a diverging, elliptical geometry - so the divergence is typically specified in both the x and y axes separately. The axis with the larger divergence is called the "fast axis" and the axis with the smaller divergence is called the "slow axis".

When selecting a lens to collimate the laser, first consider the Numerical Aperture of the lens. If the application requires a high amount of the laser light to be coupled through the system, a lens with a high enough NA must be chosen. The NA of a lens is a measure of the maximum amount of divergence that the lens can capture from the laser. Ideally, a lens should be used that has an NA higher than the NA of the laser's fast axis. If not, the laser will "clip" the lens causing some of the light to be wasted. To convert the NA to the divergence angle (and vice-versa), use this formula.

$$NA = n \cdot \sin(\phi)$$

In most cases  $n = 1$  since the NA of the laser is defined in air. Therefore, solving for the equation is simplified to:

$$(\phi) = \sin^{-1}(NA)$$

It is important to note that  $\phi$  is the **half** angle of the divergence cone and is given at the **marginal ray** (not  $1/e^2$  or half angle half max). After the minimum NA necessary for the lens is determined, next consider what beam diameter is preferred. Although ray-tracing is necessary to

precisely determine the beam diameter for a given NA source with a particular lens, it can be approximated with the following formula.

$$\text{Beam Diameter} \cong 2 \cdot \text{EFL} \cdot \text{NA}$$

where EFL is the effective focal length of the lens and NA is the numerical aperture of the source (not the NA of the lens).

### Important Note:

Some laser manufacturers give the NA of the source in different terms, such as half max (50% point) or  $1/e^2$  (87% point). Whatever type of number is entered into the formula for the NA of the source will be the same type of number given for the beam diameter. For example, if the half max NA for a laser is used with the above formula, you will get the half max beam diameter. There is no simple way to convert from a half max number or a  $1/e^2$  beam diameter to a full beam diameter for a specific source because it depends on the intensity profile of the source itself. A reasonable approximation, though, for most edge emitting diode lasers is to assume a Gaussian beam profile. Using this beam profile, you can convert the beam diameters as follows:

1. To convert a half max beam diameter to a full beam diameter, multiply the diameter by 2.576.

2. To convert a  $1/e^2$  beam diameter to a full beam diameter, multiply the diameter by 1.517.

Remember that most edge emitting diodes are elliptical, so the beam diameter will be different in the x-axis versus the y-axis. Use the formula above to calculate the beam diameter in both axes to determine the shape of the collimated, elliptical beam.

# Choosing the Right Aspheric Lens

## FIBER COUPLING

### For Fiber Coupling

Another common use for aspheric lenses is to couple laser light into optical fibers. Choosing the right lens or lenses to do the coupling is important to maintain high efficiency in the optical system. The guide below is intended to show how best to do this while using off-the-shelf components. This guide assumes that the input laser light has already been collimated (not diverging). When selecting a lens to focus light into a fiber, first consider what focal length lens is needed. Let's revisit the formula given previously.

$$\text{Beam Diameter} \approx 2 \cdot \text{EFL} \cdot \text{NA}$$

Solving for EFL it becomes:

$$\text{EFL} \approx \frac{\text{Beam Diameter}}{2 \cdot \text{NA}}$$

where NA is the numerical Aperture of the fiber that is used for the coupling. It is important to note that the EFL value that is calculated above is the **minimum** EFL needed to couple the light completely into the fiber. Longer EFL lenses can be used, but the spot on the fiber tip will become larger. Therefore, it is best practice to use the shortest EFL lens possible that is larger than the minimum value specified above.

**Example:** Suppose you wish to focus a collimated beam with a full beam diameter of 2.0mm into a 50 micron multimode fiber (Nufern GI50/125S).

The fiber NA given by the manufacturer is approximately 0.20. Fiber NA is normally given at the 99% power point (as opposed to  $1/e^2$  or half max), we can use the full beam diameter given.

$$\text{EFL} \approx \frac{\text{Beam Diameter}}{2 \cdot \text{NA}} \approx \frac{2.0}{2 \cdot 0.2} \approx 5.0\text{mm}$$

So it is best to look for a lens with an EFL of at least 5.0mm and a clear aperture at least 1.942mm (in order to capture the full collimated beam). One might consider the 354430 lens for its 5mm EFL (at 1550nm), but its 1.5mm clear aperture will not capture the full collimated beam. A better choice might be the 354550 lens. Its 6.10mm EFL at 1550nm becomes 5.94mm at 660nm. The lens also has a large enough clear aperture (2.2mm) to capture the entire input beam.

# 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

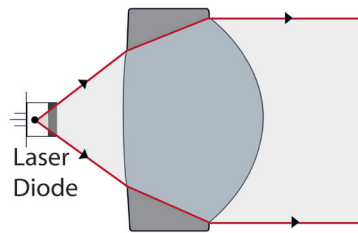
Aspheric lenses are known for their optimal performance but the expense of fabricating them has inhibited their use. LightPath's glass molding technology has enabled high volume production of aspheric optics while maintaining the highest quality at an affordable price. Because molding is the most consistent 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	Numerical Aperture	Focal Length (mm)	Outer Diameter (mm)
352080	0.55	3.89	6.33
352125	0.49	10.00	11.00
352240	0.50	8.00	9.94
353515	0.40	3.52	3.000
353525	0.45	6.69	6.325
354057	0.20	13.00	6.325
354058	0.22	12.00	6.325
354059	0.19	14.00	6.325
354060	0.30	9.60	6.325
354061	0.24	11.00	6.325
354062	0.24	11.00	6.000
354064	0.24	11.00	6.000
354105	0.56	5.50	7.20
354115	0.54	6.75	9.20
354120	0.15	15.04	4.99
354130	0.21	6.00	3.00
354140	0.58	1.45	2.40
354171	0.30	6.20	4.700
354220	0.25	11.00	7.22
354260	0.16	15.29	6.50
354280	0.15	18.40	6.50
354306	0.27	9.85	6.350
354330	0.68	3.10	6.33
354340	0.64	4.03	6.33
354350	0.43	4.50	4.70
354430	0.15	5.00	2.00
354450	0.30	1.16	1.80
354453	0.55	4.60	6.00
354550	0.18	6.10	2.79
354560	0.18	13.86	6.33
354710	0.53	1.49	2.65
354850	0.13	22.00	6.33
354996	0.30	4.50	3.000
355022	0.47	4.47	5.42
355070	0.66	0.43	1.20
355110	0.40	6.24	7.20

Geltech Asphere Performance Parameters			
Lens Code	Numerical Aperture	Focal Length (mm)	Outer Diameter (mm)
355150	0.51	2.00	3.00
355151	0.50	2.00	3.00
355160	0.55	2.73	4.00
355200	0.43	1.14	2.40
355201	0.43	1.14	2.40
355230	0.55	4.51	6.33
355330	0.77	3.10	6.33
355375	0.30	7.50	6.51
355390	0.55	2.75	4.50
355392	0.64	2.75	4.00
355397	0.30	11.00	7.20
355410	0.20	2.51	1.80
355440	0.52	2.76	4.70
355460	0.10	0.55	1.00
355485	0.10	0.55	1.40
355487	0.11	0.55	1.00
355536	0.60	0.60	1.24
355561	0.60	10.04	15.00
355615	0.20	2.51	2.05
355631	0.13	0.39	1.20
355660	0.60	2.97	4.00
355755	0.15	1.94	1.70
355840	0.47	0.75	1.40
355880	0.60	0.70	1.20
355915	0.50	0.80	1.30
355940	0.17	4.02	1.82
355945	0.32	2.51	2.10
355950	0.37	1.81	1.78
355960	0.62	1.00	1.82
355970	0.21	3.70	1.80
356300	0.66	2.54	4.000
356785	0.62	1.42	2.750
357610	0.62	4.00	6.325
357765	0.61	4.00	6.325
357775	0.60	4.02	6.325

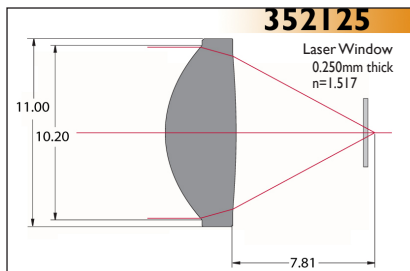


# Laser Diode Collimating Lenses

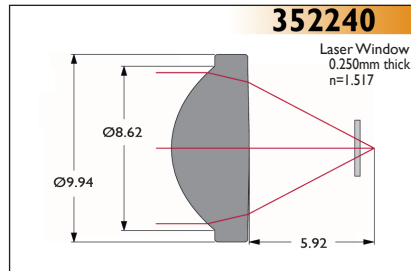


Lens Code	NA	CA (mm)	EFL (mm)	OD (mm)	WD (mm)
355536	0.60	0.72	0.60	1.24	0.22
355880	0.60	0.84	0.70	1.20	0.33
355840	0.47	0.71	0.75	1.40	0.43
355960	0.62	1.20	1.00	1.82	0.24
356785	0.62	1.70	1.42	2.750	0.86
354140	0.58	1.60	1.45	2.40	0.81
354710	0.53	1.50	1.49	2.65	1.02
355950	0.37	1.35	1.81	1.78	1.09
355150	0.51	2.20	2.00	3.00	1.45
355151	0.50	2.00	2.00	3.00	1.03
355945	0.32	1.60	2.51	2.10	1.76
356300	0.66	3.30	2.54	4.000	1.55
355390	0.55	3.60	2.75	4.50	2.16
355392	0.64	3.60	2.75	4.00	1.50
355660	0.60	3.60	2.97	4.00	1.56
354330	0.68	5.00	3.10	6.33	1.76
355330	0.77	5.00	3.10	6.33	1.59
353515	0.40	2.70	3.52	3.000	2.33
357765	0.61	4.80	4.00	6.325	2.37
357775	0.60	4.80	4.02	6.325	2.41
354350	0.43	3.70	4.50	4.70	2.19
354996	0.30	2.70	4.50	3.000	3.46
355230	0.55	5.07	4.51	6.33	3.08
354453	0.55	4.80	4.60	6.00	2.71
354105	0.56	6.00	5.50	7.20	3.73
354171	0.30	3.70	6.20	4.700	4.10
355110	0.40	5.00	6.24	7.20	3.46
353525	0.45	5.75	6.69	6.325	4.87
354115	0.54	7.00	6.75	9.20	4.26
355375	0.30	4.54	7.50	6.51	5.82
352240	0.50	8.00	8.00	9.94	5.92
354060	0.27	5.20	9.60	6.325	8.11
354306	0.27	5.20	9.85	6.350	8.38
352125	0.49	10.00	10.00	11.00	7.81
355561	0.60	12.50	10.04	15.00	7.04
354061	0.24	5.20	11.00	6.325	9.56
354062	0.24	5.20	11.00	6.000	9.66
354064	0.24	5.20	11.00	6.000	9.35
354220	0.25	5.50	11.00	7.22	7.91
355397	0.30	6.68	11.00	7.20	10.01
354058	0.22	5.20	12.00	6.325	10.57
354057	0.20	5.20	13.00	6.325	11.58
354059	0.19	5.20	14.00	6.325	12.63

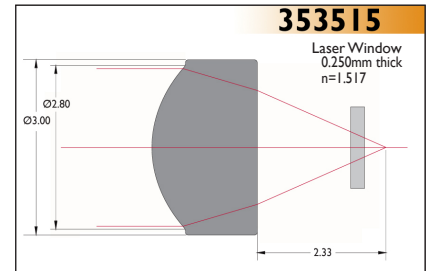
# Laser Diode Collimating Lenses



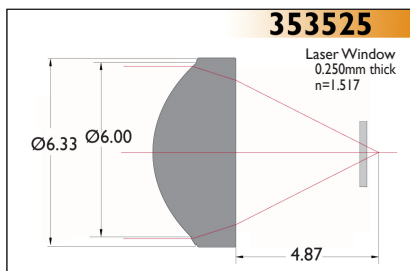
Design Wavelength	633nm	Outer Diameter	11.00mm
Numerical Aperture	0.49	RMS WFE	< 0.027
Focal Length	10.00mm	Magnification	Infinite
Clear Aperture	10.00mm	Center Thickness	4.00mm
Working Distance	7.81mm	Scratch/Dig	60-40



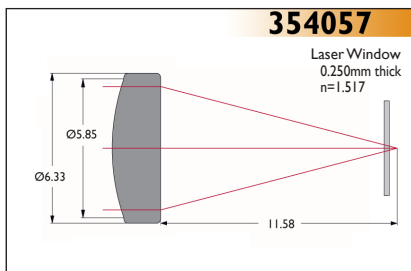
Design Wavelength	780nm	Outer Diameter	9.94mm
Numerical Aperture	0.50	RMS WFE	< 0.087
Focal Length	8.00mm	Magnification	Infinite
Clear Aperture	8.00mm	Center Thickness	3.69mm
Working Distance	5.92mm	Scratch/Dig	40-20



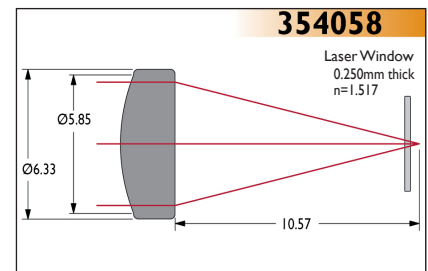
Design Wavelength	515nm	Outer Diameter	3.00mm
Numerical Aperture	0.40	RMS WFE	< 0.040
Focal Length	3.52mm	Magnification	Infinite
Clear Aperture	2.70mm	Center Thickness	1.91mm
Working Distance	2.33mm	Scratch/Dig	40-20



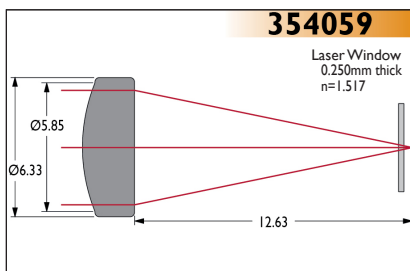
Design Wavelength	515nm	Outer Diameter	6.33mm
Numerical Aperture	0.45	RMS WFE	< 0.050
Focal Length	6.69mm	Magnification	Infinite
Clear Aperture	5.75mm	Center Thickness	2.85mm
Working Distance	4.87mm	Scratch/Dig	40-20



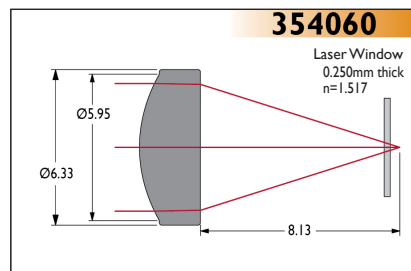
Design Wavelength	633nm	Outer Diameter	6.33mm
Numerical Aperture	0.20	RMS WFE	< 0.250
Focal Length	13.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.38mm
Working Distance	11.58mm	Scratch/Dig	60-40



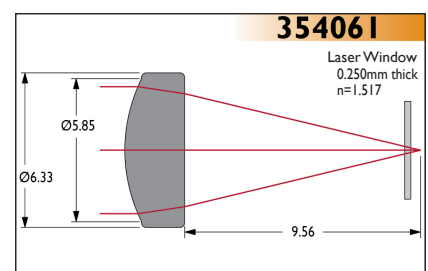
Design Wavelength	633nm	Outer Diameter	6.33mm
Numerical Aperture	0.22	RMS WFE	< 0.250
Focal Length	12.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.40mm
Working Distance	10.57mm	Scratch/Dig	60-40



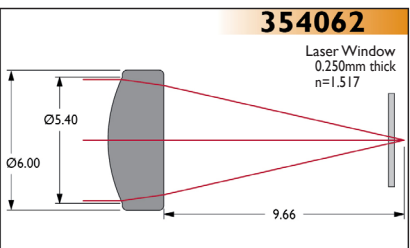
Design Wavelength	633nm	Outer Diameter	6.33mm
Numerical Aperture	0.19	RMS WFE	< 0.250
Focal Length	14.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.35mm
Working Distance	12.63mm	Scratch/Dig	60-40



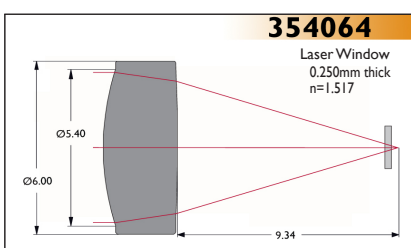
Design Wavelength	633nm	Outer Diameter	6.33mm
Numerical Aperture	0.30	RMS WFE	< 0.050
Focal Length	9.60mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.50mm
Working Distance	8.13mm	Scratch/Dig	60-40



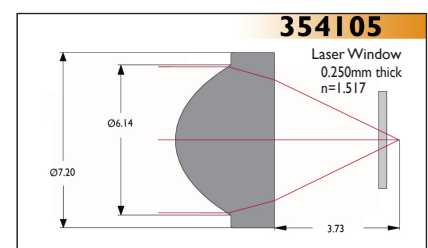
Design Wavelength	633nm	Outer Diameter	6.33mm
Numerical Aperture	0.24	RMS WFE	< 0.250
Focal Length	11.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.43mm
Working Distance	9.56mm	Scratch/Dig	60-40



Design Wavelength	633nm	Outer Diameter	6.00mm
Numerical Aperture	0.24	RMS WFE	< 0.055
Focal Length	11.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.25mm
Working Distance	9.66mm	Scratch/Dig	100-60

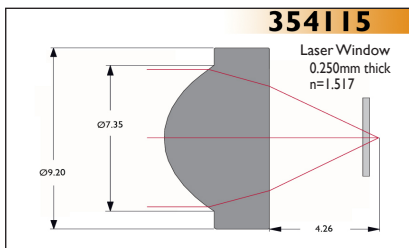


Design Wavelength	633nm	Outer Diameter	6.00mm
Numerical Aperture	0.24	RMS WFE	< 0.05
Focal Length	11.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	3.10mm
Working Distance	9.35mm	Scratch/Dig	80-50

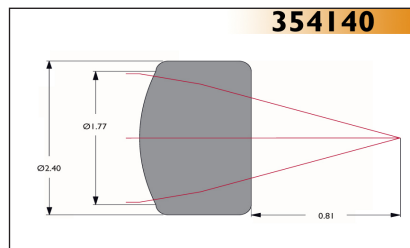


Design Wavelength	633nm	Outer Diameter	7.20mm
Numerical Aperture	0.56	RMS WFE	< 0.070
Focal Length	5.50mm	Magnification	Infinite
Clear Aperture	6.00mm	Center Thickness	2.94mm
Working Distance	3.73mm	Scratch/Dig	40-20

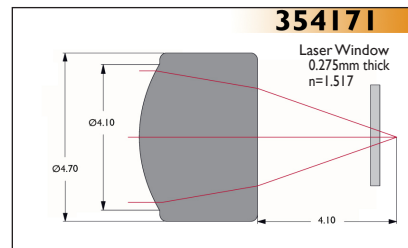
# Laser Diode Collimating Lenses



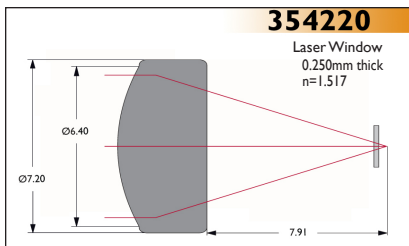
Design Wavelength	633nm	Outer Diameter	9.20mm
Numerical Aperture	0.54	RMS WFE	< 0.087
Focal Length	6.75mm	Magnification	Infinite
Clear Aperture	7.00mm	Center Thickness	4.08mm
Working Distance	4.26mm	Scratch/Dig	60-40



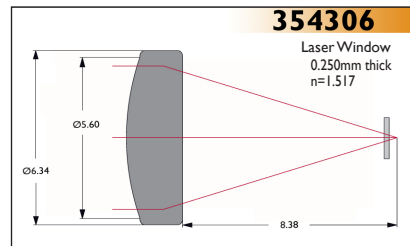
Design Wavelength	780nm	Outer Diameter	2.40mm
Numerical Aperture	0.58	RMS WFE	< 0.080
Focal Length	1.45mm	Magnification	Infinite
Clear Aperture	1.60mm	Center Thickness	1.02mm
Working Distance	0.81mm	Scratch/Dig	40-20



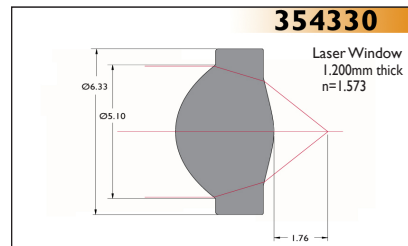
Design Wavelength	633nm	Outer Diameter	4.70mm
Numerical Aperture	0.30	RMS WFE	< 0.050
Focal Length	6.20mm	Magnification	Infinite
Clear Aperture	3.70mm	Center Thickness	3.48mm
Working Distance	4.10mm	Scratch/Dig	80-50



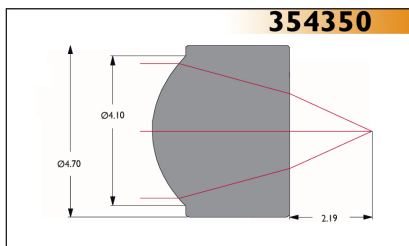
Design Wavelength	633nm	Outer Diameter	7.22mm
Numerical Aperture	0.25	RMS WFE	< 0.040
Focal Length	11.00mm	Magnification	Infinite
Clear Aperture	5.50mm	Center Thickness	5.03mm
Working Distance	7.91mm	Scratch/Dig	40-20



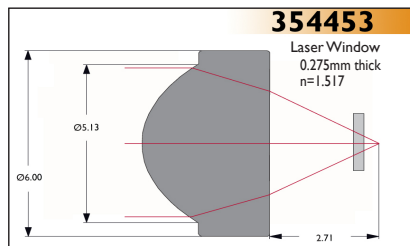
Design Wavelength	650nm	Outer Diameter	6.35mm
Numerical Aperture	0.27	RMS WFE	< 0.050
Focal Length	9.85mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.50mm
Working Distance	8.38mm	Scratch/Dig	40-20



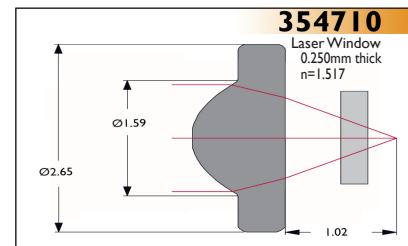
Design Wavelength	830nm	Outer Diameter	6.33mm
Numerical Aperture	0.68	RMS WFE	< 0.330
Focal Length	3.10mm	Magnification	Infinite
Clear Aperture	5.00mm	Center Thickness	3.21mm
Working Distance	1.76mm	Scratch/Dig	40-20



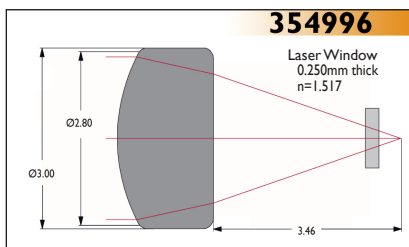
Design Wavelength	980nm	Outer Diameter	4.70mm
Numerical Aperture	0.43	RMS WFE	< 0.06
Focal Length	4.50mm	Magnification	Infinite
Clear Aperture	3.70mm	Center Thickness	3.65mm
Working Distance	2.19mm	Scratch/Dig	40-20



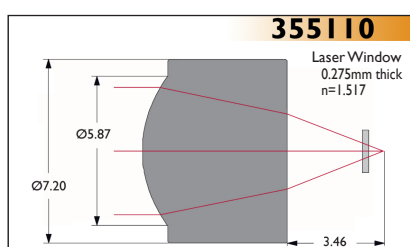
Design Wavelength	655nm	Outer Diameter	6.00mm
Numerical Aperture	0.55	RMS WFE	< 0.070
Focal Length	4.60mm	Magnification	Infinite
Clear Aperture	4.80mm	Center Thickness	3.14mm
Working Distance	2.71mm	Scratch/Dig	40-20



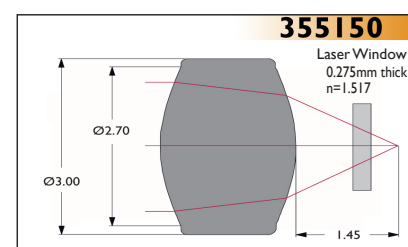
Design Wavelength	1550nm	Outer Diameter	2.65mm
Numerical Aperture	0.53	RMS WFE	< 0.08
Focal Length	1.49mm	Magnification	Infinite
Clear Aperture	1.50mm	Center Thickness	0.86mm
Working Distance	1.02mm	Scratch/Dig	40-20



Design Wavelength	634nm	Outer Diameter	3.00mm
Numerical Aperture	0.30	RMS WFE	< 0.100
Focal Length	4.50mm	Magnification	Infinite
Clear Aperture	2.70mm	Center Thickness	1.78mm
Working Distance	3.46mm	Scratch/Dig	60-40

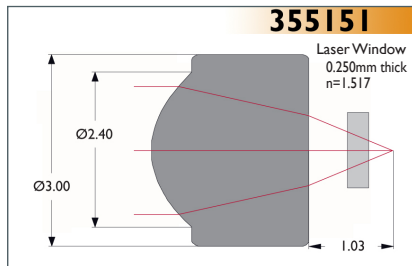


Design Wavelength	780nm	Outer Diameter	7.20mm
Numerical Aperture	0.40	RMS WFE	< 0.070
Focal Length	6.24mm	Magnification	Infinite
Clear Aperture	5.00mm	Center Thickness	5.16mm
Working Distance	3.46mm	Scratch/Dig	40-20

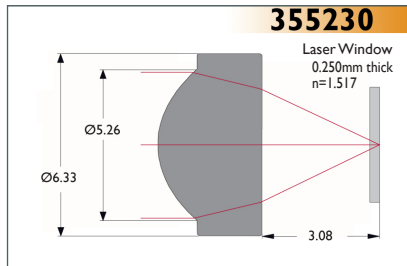


Design Wavelength	780nm	Outer Diameter	3.00mm
Numerical Aperture	0.51	RMS WFE	N/A
Focal Length	2.00mm	Magnification	Infinite
Clear Aperture	2.20mm	Center Thickness	1.92mm
Working Distance	1.45mm	Scratch/Dig	40-20

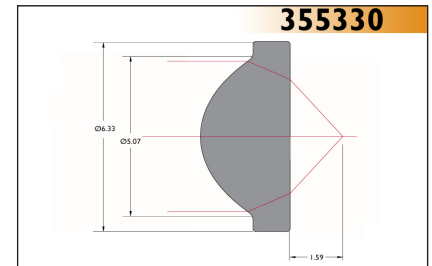
# Laser Diode Collimating Lenses



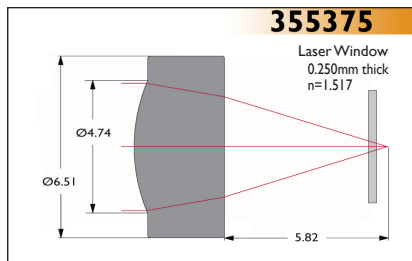
Design Wavelength	780nm	Outer Diameter	3.00mm
Numerical Aperture	0.50	RMS WFE	< 0.070
Focal Length	2.00mm	Magnification	Infinite
Clear Aperture	2.00mm	Center Thickness	1.90mm
Working Distance	1.03mm	Scratch/Dig	40-20



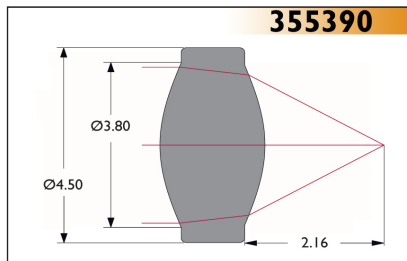
Design Wavelength	780nm	Outer Diameter	6.33mm
Numerical Aperture	0.55	RMS WFE	< 0.087
Focal Length	4.51mm	Magnification	Infinite
Clear Aperture	5.07mm	Center Thickness	2.71mm
Working Distance	3.08mm	Scratch/Dig	40-20



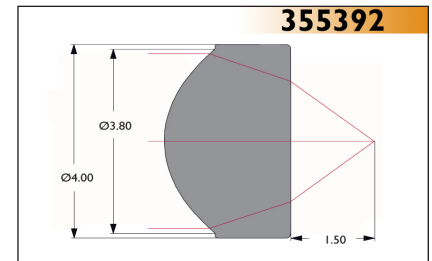
Design Wavelength	830nm	Outer Diameter	6.33mm
Numerical Aperture	0.77	RMS WFE	< 0.50
Focal Length	3.10mm	Magnification	Infinite
Clear Aperture	5.00mm	Center Thickness	2.71mm
Working Distance	1.59mm	Scratch/Dig	40-20



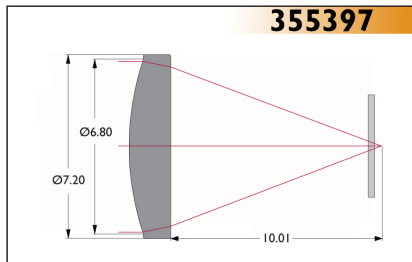
Design Wavelength	780nm	Outer Diameter	6.51mm
Numerical Aperture	0.30	RMS WFE	< 0.050
Focal Length	7.50mm	Magnification	Infinite
Clear Aperture	4.54mm	Center Thickness	3.19mm
Working Distance	5.82mm	Scratch/Dig	40-20



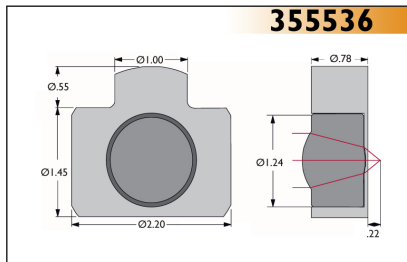
Design Wavelength	830nm	Outer Diameter	4.50mm
Numerical Aperture	0.55	RMS WFE	< 0.093
Focal Length	2.75mm	Magnification	Infinite
Clear Aperture	3.60mm	Center Thickness	1.90mm
Working Distance	2.16mm	Scratch/Dig	40-20



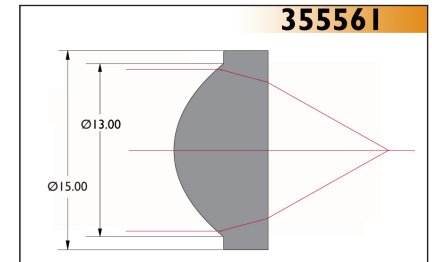
Design Wavelength	830nm	Outer Diameter	4.00mm
Numerical Aperture	0.64	RMS WFE	< 0.160
Focal Length	2.75mm	Magnification	Infinite
Clear Aperture	3.60mm	Center Thickness	2.24mm
Working Distance	1.50mm	Scratch/Dig	40-20



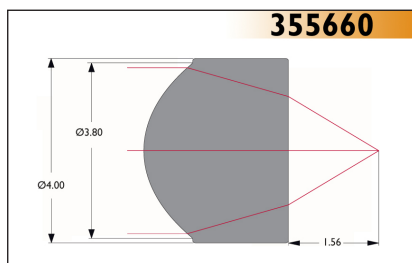
Design Wavelength	670nm	Outer Diameter	7.20mm
Numerical Aperture	0.30	RMS WFE	< 0.070
Focal Length	11.00mm	Magnification	Infinite
Clear Aperture	6.68mm	Center Thickness	1.95mm
Working Distance	10.01mm	Scratch/Dig	60-40



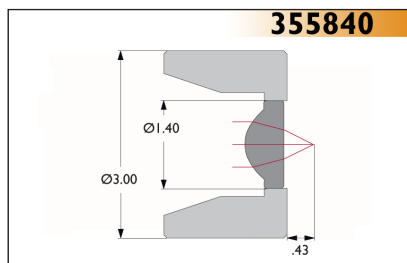
Design Wavelength	1310nm	Outer Diameter	1.24mm
Numerical Aperture	0.60	RMS WFE	< 0.035
Focal Length	0.60mm	Magnification	Infinite
Clear Aperture	0.72mm	Center Thickness	0.87mm
Working Distance	0.22mm	Scratch/Dig	40-20



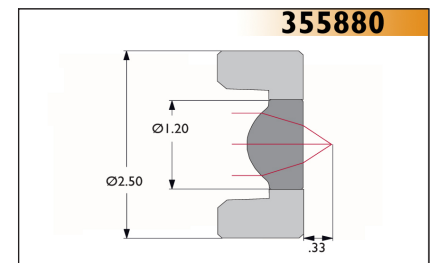
Design Wavelength	850nm	Outer Diameter	15.00mm
Numerical Aperture	0.60	RMS WFE	N/A
Focal Length	10.04mm	Magnification	Infinite
Clear Aperture	12.50mm	Center Thickness	5.38mm
Working Distance	7.04mm	Scratch/Dig	40-20



Design Wavelength	1550nm	Outer Diameter	4.00mm
Numerical Aperture	0.60	RMS WFE	< 0.20
Focal Length	2.97mm	Magnification	Infinite
Clear Aperture	3.60mm	Center Thickness	2.50mm
Working Distance	1.56mm	Scratch/Dig	40-20

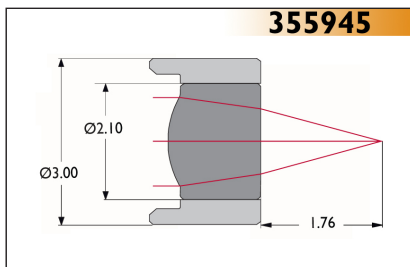


Design Wavelength	940nm	Outer Diameter	1.40mm
Numerical Aperture	0.47	RMS WFE	< 0.05
Focal Length	0.75mm	Magnification	Infinite
Clear Aperture	0.71mm	Center Thickness	0.57mm
Working Distance	0.43mm	Scratch/Dig	40-20

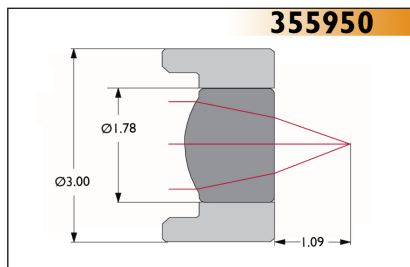


Design Wavelength	1550nm	Outer Diameter	1.20mm
Numerical Aperture	0.60	RMS WFE	< 0.040
Focal Length	0.70mm	Magnification	Infinite
Clear Aperture	0.84mm	Center Thickness	0.66mm
Working Distance	0.33mm	Scratch/Dig	40-20

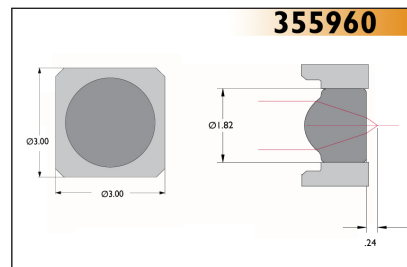
# Laser Diode Collimating Lenses



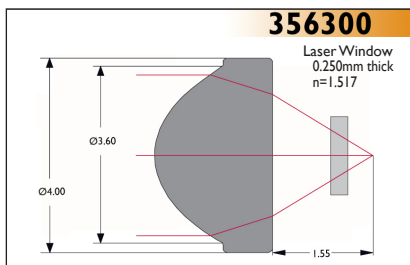
Design Wavelength	1550nm	Outer Diameter	2.10mm
Numerical Aperture	0.32	RMS WFE	< 0.070
Focal Length	2.51mm	Magnification	Infinite
Clear Aperture	1.60mm	Center Thickness	1.33mm
Working Distance	1.76mm	Scratch/Dig	40-20



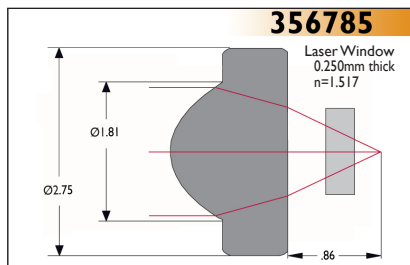
Design Wavelength	1550nm	Outer Diameter	1.78mm
Numerical Aperture	0.37	RMS WFE	< 0.070
Focal Length	1.81mm	Magnification	Infinite
Clear Aperture	1.35mm	Center Thickness	1.28mm
Working Distance	1.09mm	Scratch/Dig	40-20



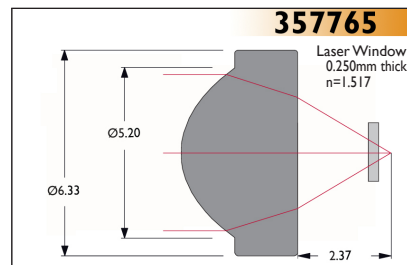
Design Wavelength	1550nm	Outer Diameter	1.82mm
Numerical Aperture	0.62	RMS WFE	< 0.12
Focal Length	1.00mm	Magnification	Infinite
Clear Aperture	1.20mm	Center Thickness	1.34mm
Working Distance	0.24mm	Scratch/Dig	40-20



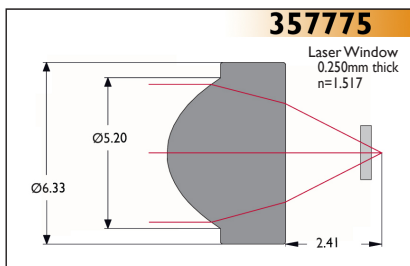
Design Wavelength	405nm	Outer Diameter	4.00mm
Numerical Aperture	0.66	RMS WFE	< 0.070
Focal Length	2.54mm	Magnification	Infinite
Clear Aperture	3.30mm	Center Thickness	1.82mm
Working Distance	1.55mm	Scratch/Dig	40-20



Design Wavelength	488nm	Outer Diameter	2.75mm
Numerical Aperture	0.62	RMS WFE	< 0.050
Focal Length	1.42mm	Magnification	Infinite
Clear Aperture	1.70mm	Center Thickness	1.08mm
Working Distance	0.86mm	Scratch/Dig	20-10

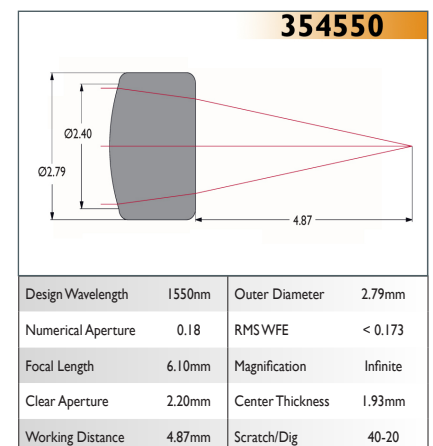
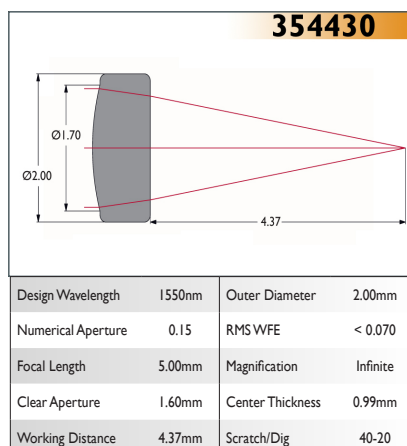
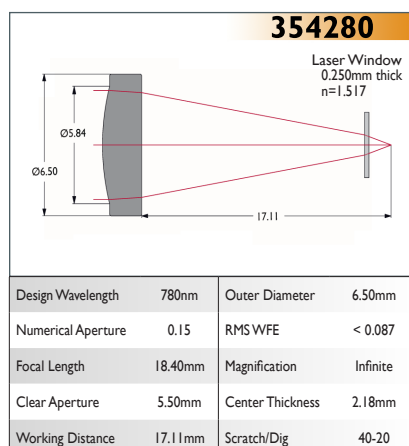
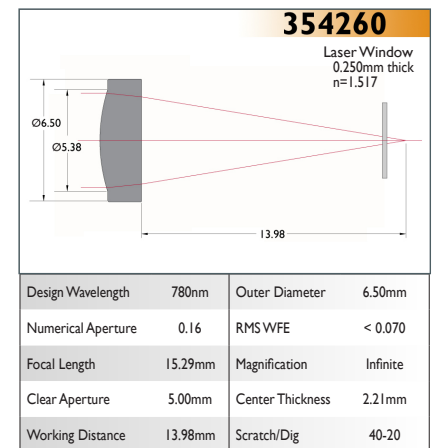
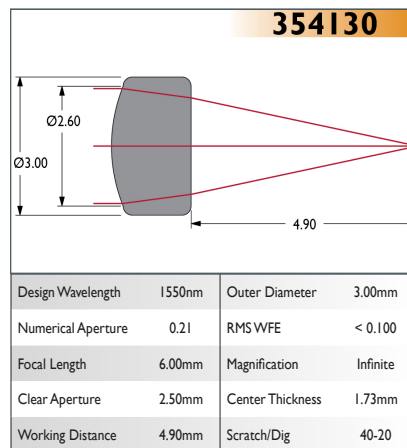
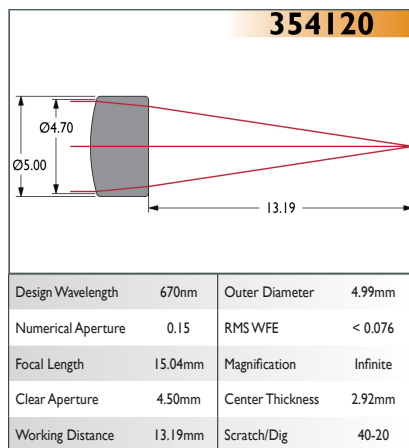
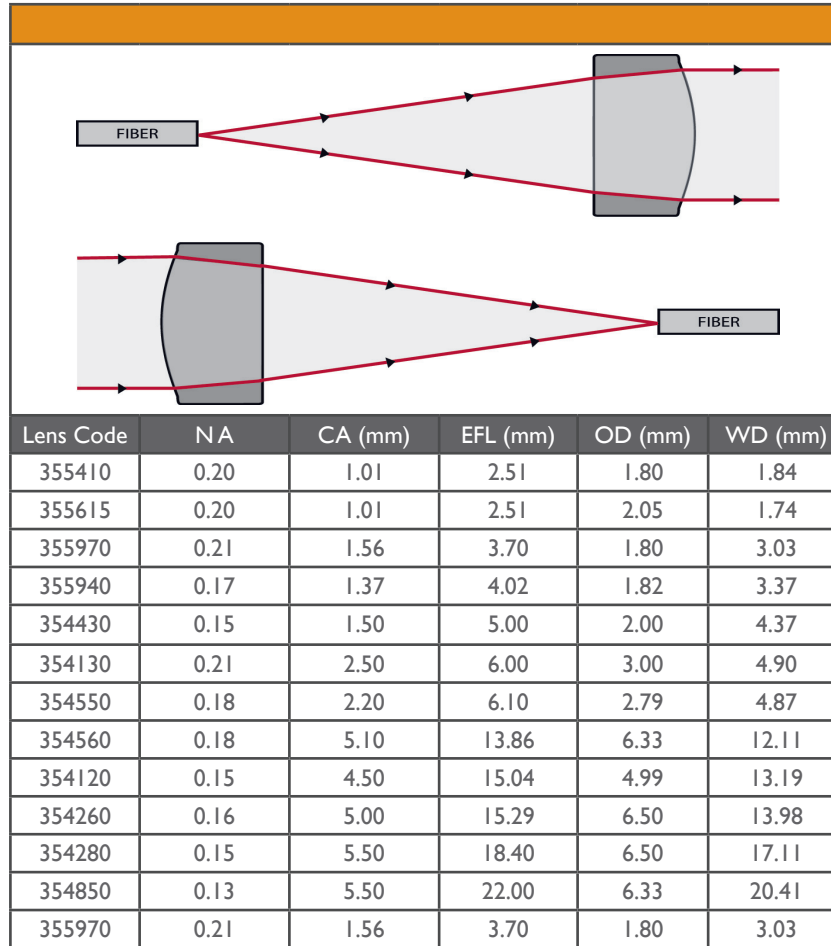


Design Wavelength	488nm	Outer Diameter	6.33mm
Numerical Aperture	0.61	RMS WFE	< 0.10
Focal Length	4.00mm	Magnification	Infinite
Clear Aperture	4.80mm	Center Thickness	2.92mm
Working Distance	2.37mm	Scratch/Dig	20-10



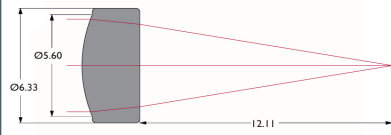
Design Wavelength	408nm	Outer Diameter	6.33mm
Numerical Aperture	0.60	RMS WFE	< 0.150
Focal Length	4.02mm	Magnification	Infinite
Clear Aperture	4.80mm	Center Thickness	2.90mm
Working Distance	2.41mm	Scratch/Dig	40-20

# Fiber Collimating Lenses



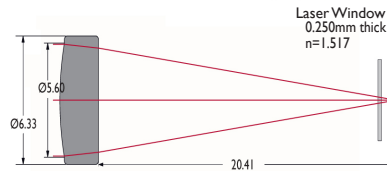
# Fiber Collimating Lenses

### 354560



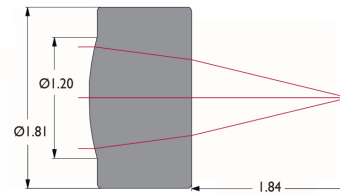
Design Wavelength	650nm	Outer Diameter	6.33mm
Numerical Aperture	0.18	RMS WFE	< 0.070
Focal Length	13.86mm	Magnification	Infinite
Clear Aperture	5.10mm	Center Thickness	2.77mm
Working Distance	12.11mm	Scratch/Dig	40-20

### 354850



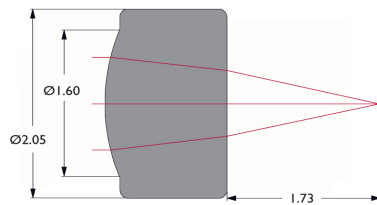
Design Wavelength	670nm	Outer Diameter	6.33mm
Numerical Aperture	0.13	RMS WFE	< 0.070
Focal Length	22.00mm	Magnification	Infinite
Clear Aperture	5.50mm	Center Thickness	2.65mm
Working Distance	20.41mm	Scratch/Dig	40-20

### 355410



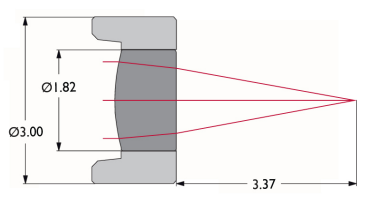
Design Wavelength	1550nm	Outer Diameter	1.80mm
Numerical Aperture	0.20	RMS WFE	< 0.070
Focal Length	2.51mm	Magnification	Infinite
Clear Aperture	1.01mm	Center Thickness	1.19mm
Working Distance	1.84mm	Scratch/Dig	40-20

### 355615



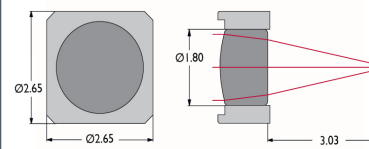
Design Wavelength	1550nm	Outer Diameter	2.05mm
Numerical Aperture	0.20	RMS WFE	< 0.070
Focal Length	2.51mm	Magnification	Infinite
Clear Aperture	1.01mm	Center Thickness	1.38mm
Working Distance	1.73mm	Scratch/Dig	40-20

### 355940



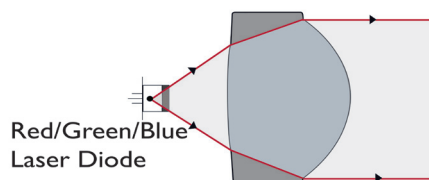
Design Wavelength	1550nm	Outer Diameter	1.82mm
Numerical Aperture	0.17	RMS WFE	< 0.030
Focal Length	4.02mm	Magnification	Infinite
Clear Aperture	1.37mm	Center Thickness	1.16mm
Working Distance	3.37mm	Scratch/Dig	40-20

### 355970

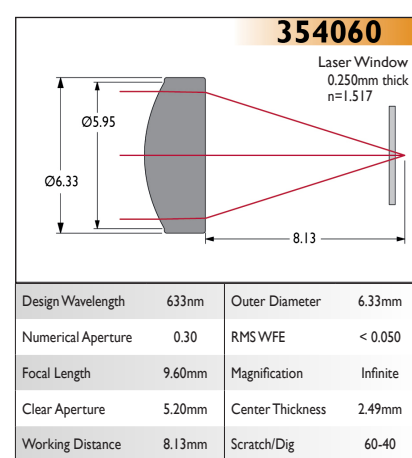
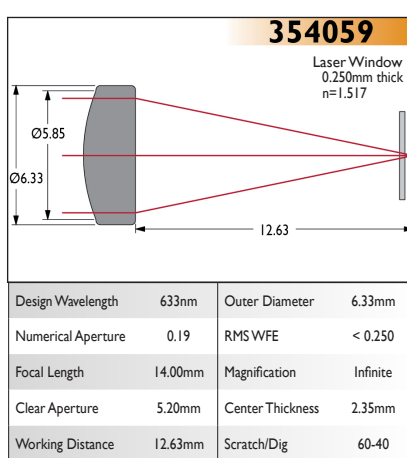
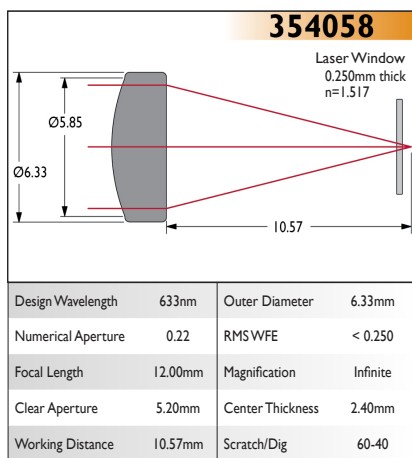
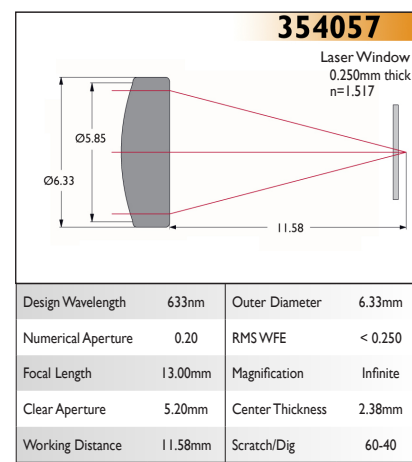
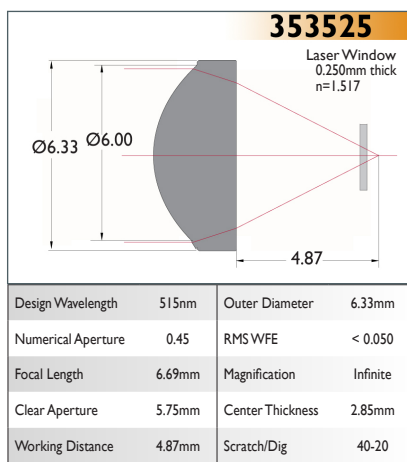
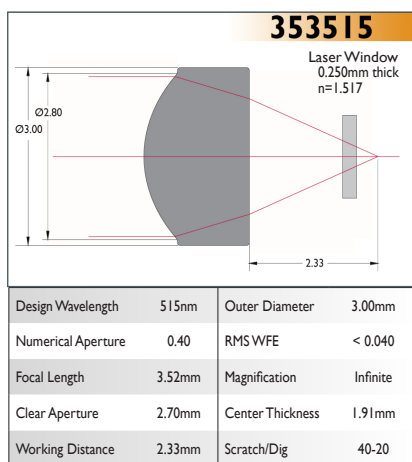


Design Wavelength	1550nm	Outer Diameter	1.80mm
Numerical Aperture	0.21	RMS WFE	< 0.070
Focal Length	3.70mm	Magnification	Infinite
Clear Aperture	1.56mm	Center Thickness	1.19mm
Working Distance	3.03mm	Scratch/Dig	40-20

# Laser Tool Lenses

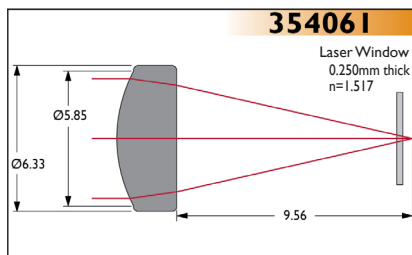


Lens Code	NA	CA (mm)	EFL (mm)	OD (mm)	WD (mm)	Color
356785	0.62	1.70	1.42	2.750	0.86	Blue
356300	0.66	3.30	2.54	4.000	1.55	Blue
353515	0.40	2.70	3.52	3.000	2.33	Green
357765	0.61	4.80	4.00	6.325	2.37	Blue
357775	0.60	4.80	4.02	6.325	2.41	Blue
354996	0.30	2.70	4.50	3.000	3.46	Red
354171	0.30	3.70	6.20	4.700	4.10	Red
353525	0.45	5.75	6.69	6.325	4.87	Green
354060	0.27	5.20	9.60	6.325	8.11	Red
354306	0.27	5.20	9.85	6.350	8.38	Red
354061	0.24	5.20	11.00	6.325	9.55	Red
354062	0.24	5.20	11.00	6.000	9.66	Red
354064	0.24	5.20	11.00	6.000	9.35	Red
354058	0.22	5.20	12.00	6.325	10.57	Red
354057	0.20	5.20	13.00	6.325	11.58	Red
354059	0.19	5.20	14.00	6.325	12.63	Red

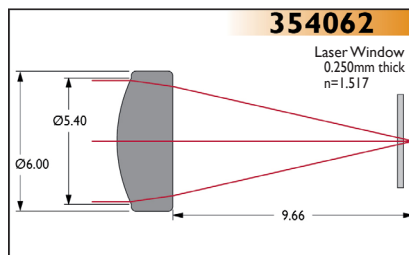




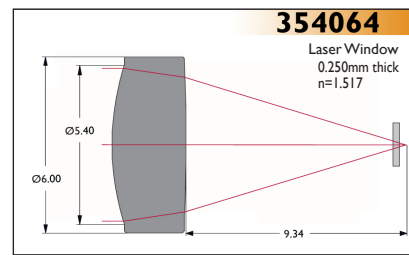
# Laser Tool Lenses



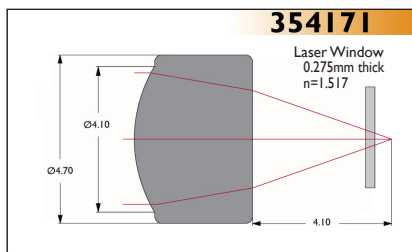
Design Wavelength	633nm	Outer Diameter	6.33mm
Numerical Aperture	0.24	RMS WFE	< 0.250
Focal Length	11.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.43mm
Working Distance	9.56mm	Scratch/Dig	60-40



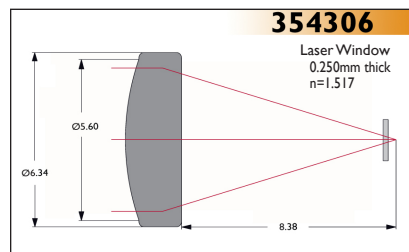
Design Wavelength	633nm	Outer Diameter	6.00mm
Numerical Aperture	0.24	RMS WFE	< 0.055
Focal Length	11.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.25mm
Working Distance	9.66mm	Scratch/Dig	100-60



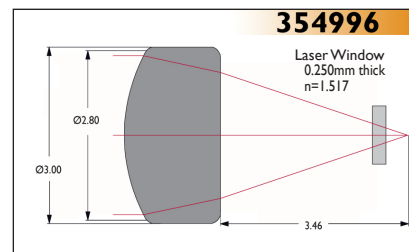
Design Wavelength	633nm	Outer Diameter	6.00mm
Numerical Aperture	0.24	RMS WFE	< 0.05
Focal Length	11.00mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	3.10mm
Working Distance	9.35mm	Scratch/Dig	80-50



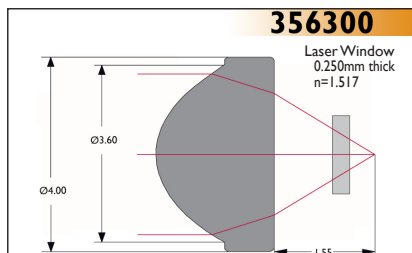
Design Wavelength	633nm	Outer Diameter	4.70mm
Numerical Aperture	0.30	RMS WFE	< 0.050
Focal Length	6.20mm	Magnification	Infinite
Clear Aperture	3.70mm	Center Thickness	3.48mm
Working Distance	4.10mm	Scratch/Dig	80-50



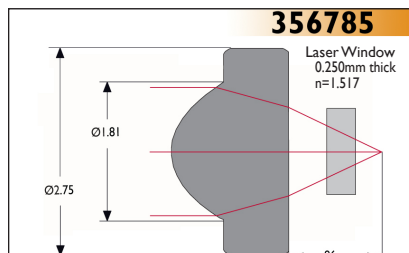
Design Wavelength	650nm	Outer Diameter	6.35mm
Numerical Aperture	0.27	RMS WFE	< 0.050
Focal Length	9.85mm	Magnification	Infinite
Clear Aperture	5.20mm	Center Thickness	2.50mm
Working Distance	8.38mm	Scratch/Dig	40-20



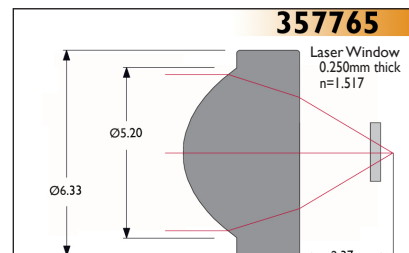
Design Wavelength	634nm	Outer Diameter	3.00mm
Numerical Aperture	0.30	RMS WFE	< 0.100
Focal Length	4.50mm	Magnification	Infinite
Clear Aperture	2.70mm	Center Thickness	1.78mm
Working Distance	3.46mm	Scratch/Dig	60-40



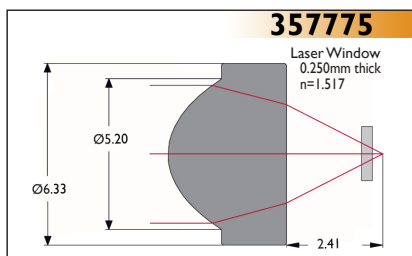
Design Wavelength	405nm	Outer Diameter	0.50mm
Numerical Aperture	0.66	RMS WFE	< 0.070
Focal Length	2.54mm	Magnification	Infinite
Clear Aperture	3.30mm	Center Thickness	1.82mm
Working Distance	1.55mm	Scratch/Dig	40-20



Design Wavelength	488nm	Outer Diameter	2.75mm
Numerical Aperture	0.62	RMS WFE	< 0.050
Focal Length	1.42mm	Magnification	Infinite
Clear Aperture	1.70mm	Center Thickness	1.08mm
Working Distance	0.86mm	Scratch/Dig	20-10

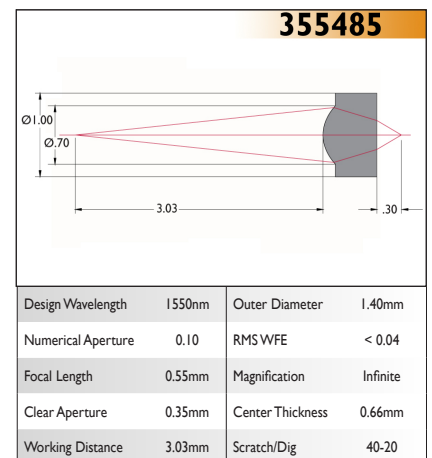
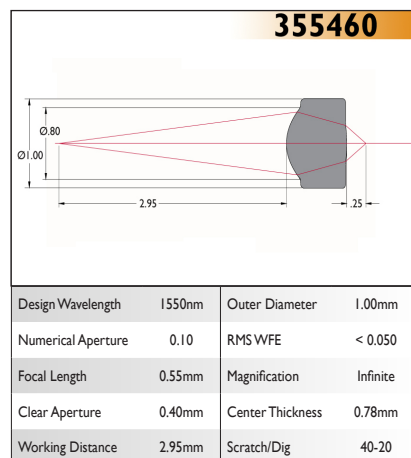
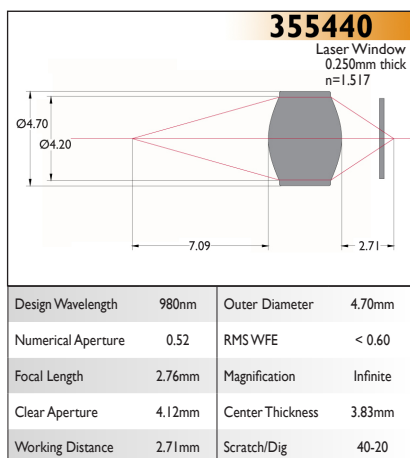
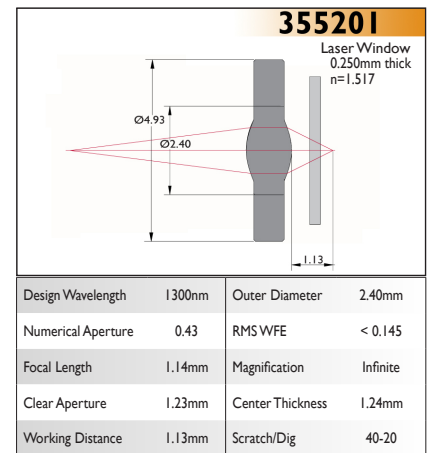
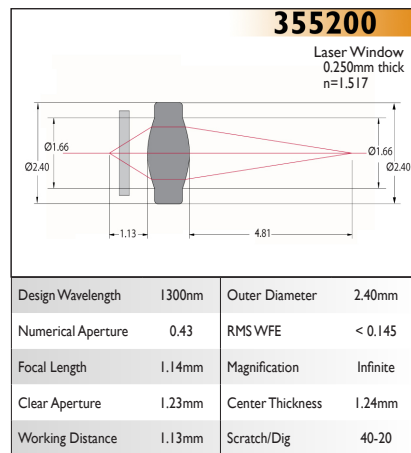
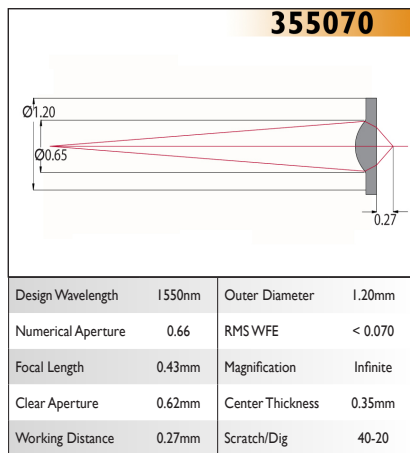
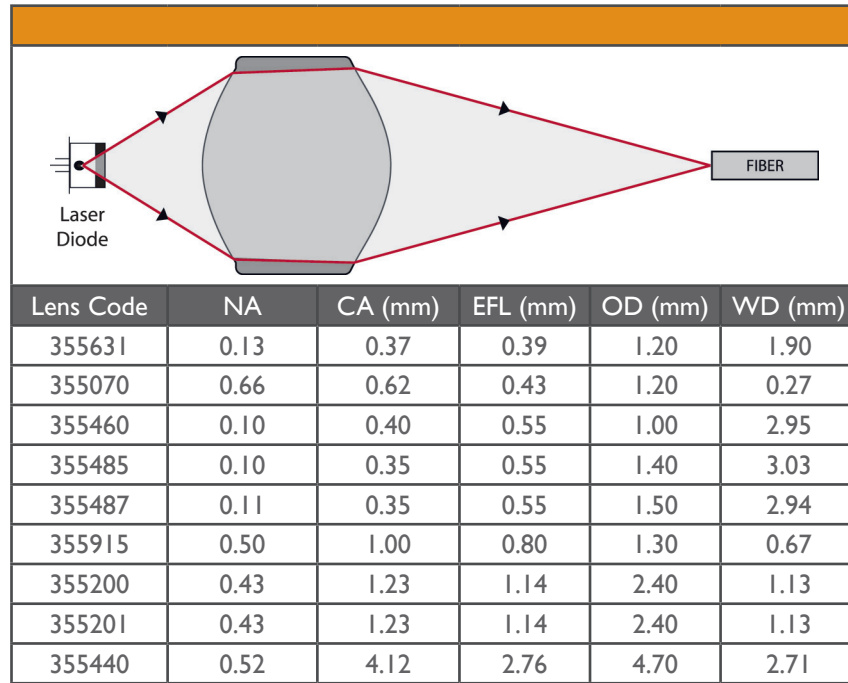


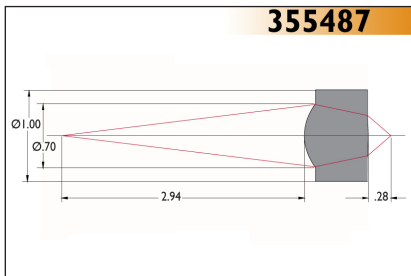
Design Wavelength	488nm	Outer Diameter	6.33mm
Numerical Aperture	0.61	RMS WFE	< 0.10
Focal Length	4.00mm	Magnification	Infinite
Clear Aperture	4.80mm	Center Thickness	2.92mm
Working Distance	2.37mm	Scratch/Dig	20-10



Design Wavelength	408nm	Outer Diameter	6.33mm
Numerical Aperture	0.60	RMS WFE	< 0.150
Focal Length	4.02mm	Magnification	Infinite
Clear Aperture	4.80mm	Center Thickness	2.90mm
Working Distance	2.41mm	Scratch/Dig	40-20

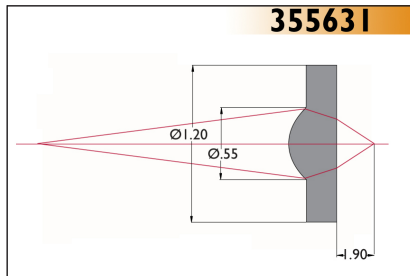
# Laser to Fiber Coupling Lenses





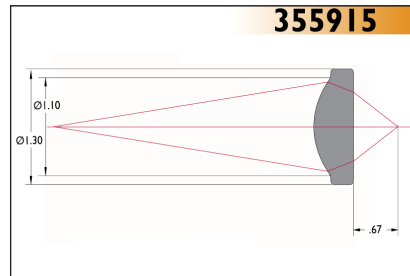
**355487**

Design Wavelength	1550nm	Outer Diameter	1.00mm
Numerical Aperture	0.11	RMS WFE	< 0.04
Focal Length	0.55mm	Magnification	Infinite
Clear Aperture	0.35mm	Center Thickness	0.78mm
Working Distance	2.94mm	Scratch/Dig	40-20



**355631**

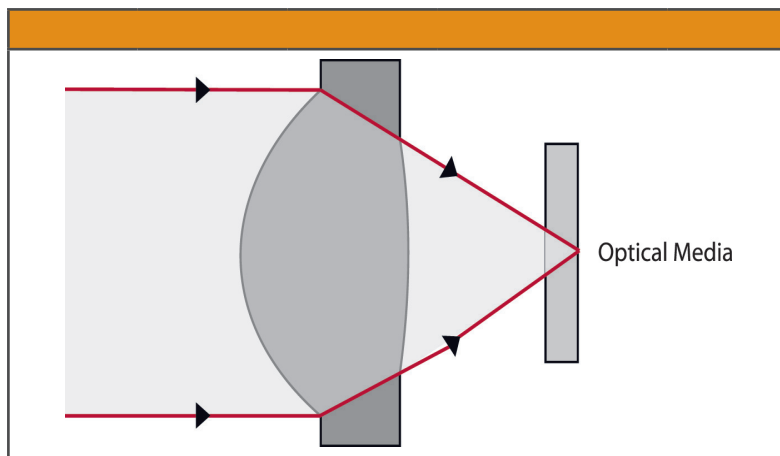
Design Wavelength	1310nm	Outer Diameter	1.20mm
Numerical Aperture	0.13	RMS WFE	< 0.06
Focal Length	0.39mm	Magnification	Infinite
Clear Aperture	0.37mm	Center Thickness	0.36mm
Working Distance	1.90mm	Scratch/Dig	40-20



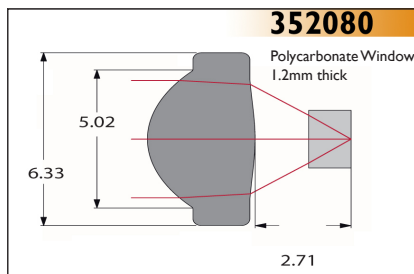
**355915**

Design Wavelength	1550nm	Outer Diameter	1.30mm
Numerical Aperture	0.50	RMS WFE	< 0.080
Focal Length	0.80mm	Magnification	Infinite
Clear Aperture	1.00mm	Center Thickness	0.60mm
Working Distance	0.67mm	Scratch/Dig	40-20

## Data Storage Objective Lenses

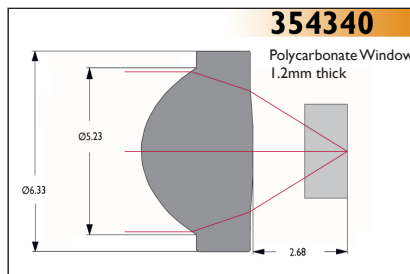


Lens Code	Numerical Aperture	Clear Aperture (mm)	Focal Length (mm)	Outer Diameter (mm)	Working Distance (mm)
355160	0.55	3.00	2.73	4.00	2.37
352080	0.55	4.29	3.89	6.33	2.71
357610	0.62	4.80	4.00	6.325	2.69
354340	0.64	5.10	4.03	6.33	2.68
355022	0.47	4.20	4.47	5.42	3.08



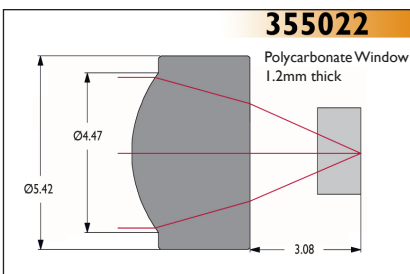
**352080**

Design Wavelength	780nm	Outer Diameter	6.33mm
Numerical Aperture	0.55	RMS WFE	< 0.087
Focal Length	3.89mm	Magnification	Infinite
Clear Aperture	4.29mm	Center Thickness	3.05mm
Working Distance	2.71mm	Scratch/Dig	40-20



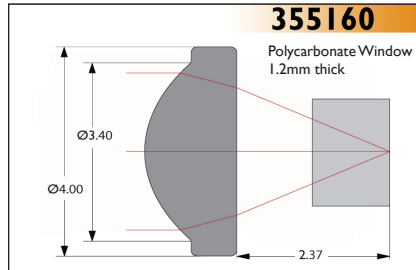
**354340**

Design Wavelength	685nm	Outer Diameter	6.33mm
Numerical Aperture	0.64	RMS WFE	< 0.100
Focal Length	4.03mm	Magnification	Infinite
Clear Aperture	5.10mm	Center Thickness	3.10mm
Working Distance	2.68mm	Scratch/Dig	40-20

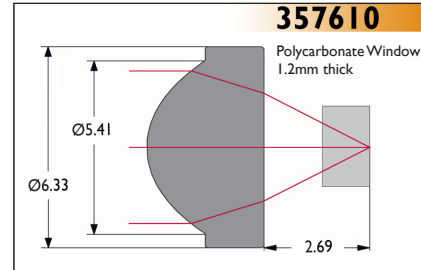


**355022**

Design Wavelength	780nm	Outer Diameter	5.42mm
Numerical Aperture	0.47	RMS WFE	< 0.070
Focal Length	4.47mm	Magnification	Infinite
Clear Aperture	4.20mm	Center Thickness	3.27mm
Working Distance	3.08mm	Scratch/Dig	40-20

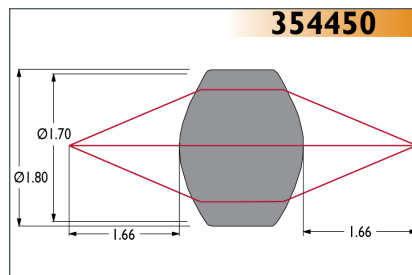
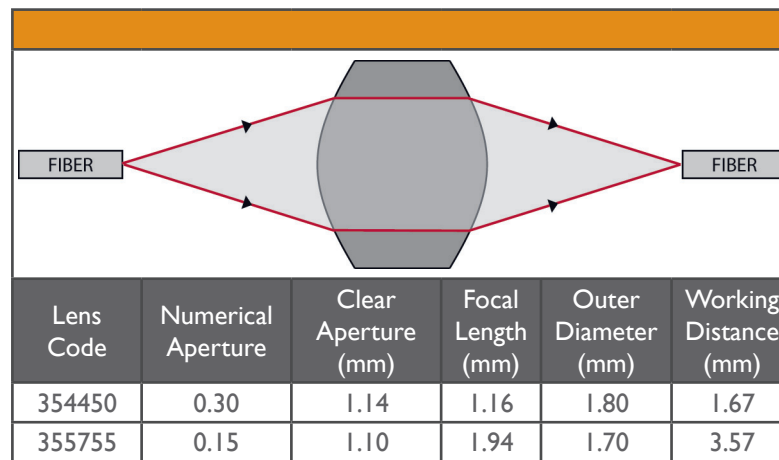


Design Wavelength	780nm	Outer Diameter	4.00mm
Numerical Aperture	0.55	RMS WFE	< 0.070
Focal Length	2.73mm	Magnification	Infinite
Clear Aperture	3.00mm	Center Thickness	1.43mm
Working Distance	2.37mm	Scratch/Dig	40-20

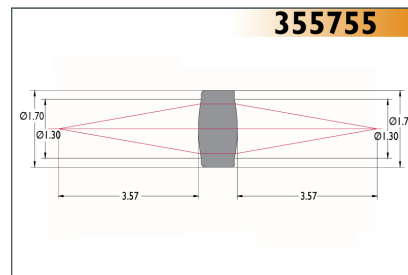


Design Wavelength	410nm	Outer Diameter	6.33mm
Numerical Aperture	0.62	RMS WFE	< 0.140
Focal Length	4.003mm	Magnification	Infinite
Clear Aperture	4.80mm	Center Thickness	2.95mm
Working Distance	2.69mm	Scratch/Dig	40-20

## Fiber to Fiber Coupling Lenses



Design Wavelength	980nm	Outer Diameter	1.80mm
Numerical Aperture	0.30	RMS WFE	< 0.070
Focal Length	1.16mm	Magnification	Infinite
Clear Aperture	1.14mm	Center Thickness	1.48mm
Working Distance	1.67mm	Scratch/Dig	40-20



Design Wavelength	1577nm	Outer Diameter	1.70mm
Numerical Aperture	0.15	RMS WFE	< 0.040
Focal Length	1.94mm	Magnification	Infinite
Clear Aperture	1.10mm	Center Thickness	1.00mm
Working Distance	3.57mm	Scratch/Dig	40-20

# Mounted Aspheric Lenses

MOLDED ASPHERIC LENSES MOUNTED FOR EASY ASSEMBLY

Ordering Information			
Part Number	Holder Type	EFL (mm)	NA
352080Y-00-MT	MT9	3.89	0.55
352125Y-00-MT	MT14	10.00	0.49
352240Y-00-MT	MT12	8.00	0.50
353515Y-00-MT	MT6B	3.52	0.40
353525Y-00-MT	MT9	6.69	0.45
354057Y-00-MT	MT9	13.00	0.20
354058Y-00-MT	MT9	12.00	0.22
354059Y-00-MT	MT9	14.00	0.19
354060Y-00-MT	MT9	9.60	0.27
354061Y-00-MT	MT9	11.00	0.24
354062Y-00-MT	MT9	11.00	0.24
354064Y-00-MT	MT9	11.00	0.24
354105Y-00-MT	MT9	5.50	0.56
354115Y-00-MT	MT12	6.75	0.54
354140Y-00-MT	MT6A	1.45	0.58
354220Y-00-MT	MT9	11.00	0.25
354260Y-00-MT	MT9	15.29	0.16
354280Y-00-MT	MT9	18.40	0.15
354306Y-00-MT	MT9	9.85	0.27
354340Y-00-MT	MT9	4.03	0.64
354350Y-00-MT	MT8	4.50	0.43
354430Y-00-MT	MT6B	5.00	0.15
354453Y-00-MT	MT9	4.60	0.55
354550Y-00-MT	MT6B	6.10	0.18
354560Y-00-MT	MT9	13.86	0.18
354710Y-00-MT	MT6B	1.49	0.53
354850Y-00-MT	MT9	22.00	0.13
354996Y-00-MT	MT6B	4.50	0.30
355022Y-00-MT	MT8	4.47	0.47
355110Y-00-MT	MT9	6.24	0.40
355150Y-00-MT	MT6B	2.00	0.51
355151Y-00-MT	MT6B	2.00	0.50
355160Y-00-MT	MT8	2.73	0.55
355200Y-00-MT	MT6B	1.14	0.43
355230Y-00-MT	MT9	4.51	0.55
355330Y-00-MT	MT9	3.10	0.77
355375Y-00-MT	MT9	7.50	0.30
355390Y-00-MT	MT8	2.75	0.68
355392Y-00-MT	MT8	2.75	0.64
355397Y-00-MT	MT9	11.00	0.30
355440Y-00-MT	MT8	2.76	0.52
355660Y-00-MT	MT8	2.97	0.60
356300Y-00-MT	MT8	2.54	0.66
356785Y-00-MT	MT6B	1.42	0.62
357610Y-00-MT	MT9	4.00	0.62
357765Y-00-MT	MT9	4.00	0.61
357775Y-00-MT	MT9	4.02	0.60
357786Y-00-MT	MT6B	1.41	0.50



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

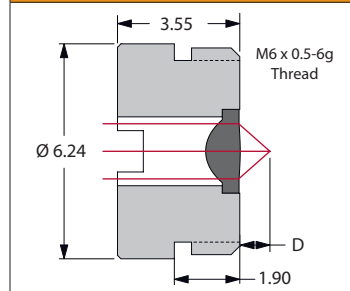
# Mounted Aspheric Lenses

MOLDED ASPHERIC LENSES MOUNTED FOR EASY ASSEMBLY

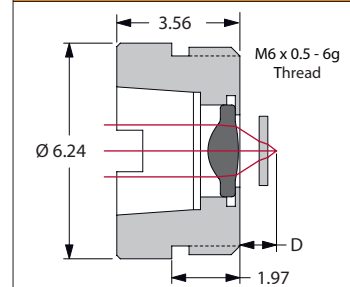
## General Specifications and Tolerances

Holder Material	Stainless Steel 304
Holder Outer Diameter	$\pm 0.025\text{mm}$
Holder Inner Diameter	$\pm 0.100\text{mm}$
Holder Length	$\pm 0.100\text{mm}$
Length of Threaded Section	$\pm 0.100\text{mm}$

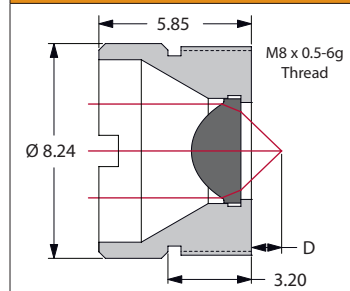
### Lens Holder MT6A



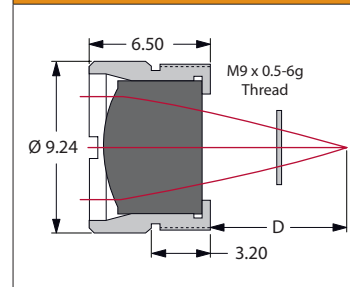
### Lens Holder MT6B



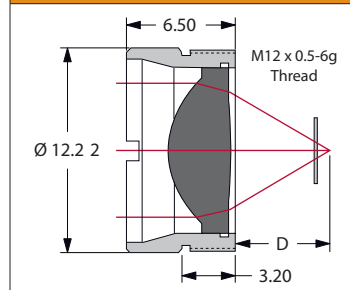
### Lens Holder MT8



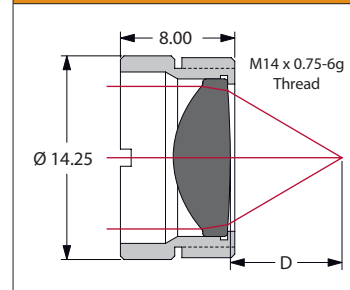
### Lens Holder MT9



### Lens Holder MT12



### Lens Holder MT14



# Connectorized Aspheric Fiber Optic Collimators

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

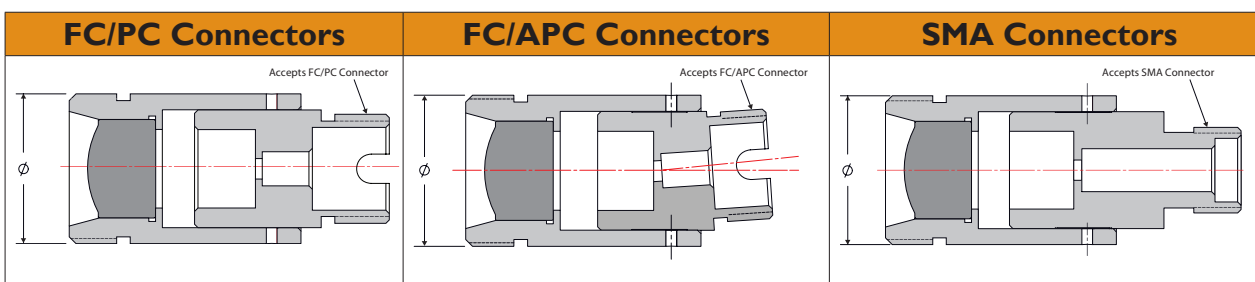
- Optimal performance using Aspheric Lenses
- Pre-aligned for popular wavelengths
- Epoxy-free optical path
- Connectorized for quick assembly
- Rugged stainless steel housing
- Threaded exterior for easy mounting



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.

Part Number	$\lambda$ (nm)	Beam $\phi$ (mm)*	AR Coating	Thread $\phi$	$\phi$ (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)
355110 - (FCPC/FCAPC/SMA) - 543	543	1.2	A	M11 x 0.5-6g	11	3.25	17.35	21.41	17.93
355110 - (FCPC/FCAPC/SMA) - 633	633	1.2	B	M11 x 0.5-6g	11	3.31	17.41	21.47	17.99
355110 - (FCPC/FCAPC/SMA) - 780	780	1.2	B	M11 x 0.5-6g	11	3.36	17.46	21.52	18.04
355110 - (FCPC/FCAPC/SMA) - 1064	1064	1.4	C	M11 x 0.5-6g	11	3.42	17.52	21.58	18.10
355110 - (FCPC/FCAPC/SMA) - 1310	1310	1.1	C	M11 x 0.5-6g	11	3.45	17.55	21.61	18.13
355110 - (FCPC/FCAPC/SMA) - 1550	1550	1.2	C	M11 x 0.5-6g	11	3.48	17.58	21.64	18.16
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	7.75	21.95	25.91	22.43
354220 - (FCPC/FCAPC/SMA) - 633	633	2.1	B	M11 x 0.5-6g	11	7.82	22.02	25.98	22.50
354220 - (FCPC/FCAPC/SMA) - 780	780	2.2	B	M11 x 0.5-6g	11	7.90	22.10	26.06	22.58
354220 - (FCPC/FCAPC/SMA) - 1064	1064	2.4	C	M11 x 0.5-6g	11	7.99	22.19	26.15	22.67
354220 - (FCPC/FCAPC/SMA) - 1310	1310	2.0	C	M11 x 0.5-6g	11	8.05	22.25	26.21	22.73
354220 - (FCPC/FCAPC/SMA) - 1550	1550	2.1	C	M11 x 0.5-6g	11	8.11	22.31	26.27	22.79
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	2.91	14.42	18.48	15.36
355230 - (FCPC/FCAPC/SMA) - 633	633	0.8	B	M11 x 0.5-6g	11	2.96	14.47	18.53	15.40
355230 - (FCPC/FCAPC/SMA) - 780	780	0.9	B	M11 x 0.5-6g	11	3.00	14.51	18.57	15.44
355230 - (FCPC/FCAPC/SMA) - 1064	1064	1.0	C	M11 x 0.5-6g	11	3.04	14.55	18.61	15.49
355230 - (FCPC/FCAPC/SMA) - 1310	1310	0.8	C	M11 x 0.5-6g	11	3.07	14.58	18.64	15.51
355230 - (FCPC/FCAPC/SMA) - 1550	1550	0.9	C	M11 x 0.5-6g	11	3.09	14.60	18.66	15.53
355230 - (FCPC/FCAPC/SMA) - Y KIT			A, B, or C	M11 x 0.5-6g	11				
352240 - (FCPC/FCAPC/SMA) - 543	543	1.6	A	M11 x 0.5-6g	12	5.68	17.43	21.39	17.91
352240 - (FCPC/FCAPC/SMA) - 633	633	1.5	B	M11 x 0.5-6g	12	5.76	17.51	21.47	17.99
352240 - (FCPC/FCAPC/SMA) - 780	780	1.6	B	M11 x 0.5-6g	12	5.81	17.56	21.52	18.04
352240 - (FCPC/FCAPC/SMA) - 1064	1064	1.8	C	M11 x 0.5-6g	12	5.88	17.63	21.59	18.11
352240 - (FCPC/FCAPC/SMA) - 1310	1310	1.5	C	M11 x 0.5-6g	12	5.92	17.67	21.63	18.15
352240 - (FCPC/FCAPC/SMA) - 1550	1550	1.5	C	M11 x 0.5-6g	12	5.96	17.71	21.67	18.19
352240 - (FCPC/FCAPC/SMA) - Y - KIT			A, B, or C	M11 x 0.5-6g	12				
354260 - (FCPC/FCAPC/SMA) - 543	543	3.0	A	M11 x 0.5-6g	11	13.66	25.05	29.36	25.53
354260 - (FCPC/FCAPC/SMA) - 633	633	2.8	B	M11 x 0.5-6g	11	13.78	25.17	29.48	25.65
354260 - (FCPC/FCAPC/SMA) - 780	780	3.1	B	M11 x 0.5-6g	11	13.89	25.28	29.59	25.76
354260 - (FCPC/FCAPC/SMA) - 1064	1064	3.3	C	M11 x 0.5-6g	11	14.03	25.42	29.73	25.90
354260 - (FCPC/FCAPC/SMA) - 1310	1310	2.8	C	M11 x 0.5-6g	11	14.12	25.51	29.82	25.99
354260 - (FCPC/FCAPC/SMA) - 1550	1550	2.9	C	M11 x 0.5-6g	11	14.21	25.60	29.91	26.08
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	2.33	13.92	17.98	14.52
357775 - (FCPC/FCAPC/SMA) - Y - KIT			UVA	M11 x 0.5-6g	11				

\* Typical beam diameter, measured at  $1/e^2$ , when using single mode fiber.





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