

Various rectangular cylindrical lenses.

- **Magnification in only one plane**
- **Convert circular beam to elliptical**
- **Ideal for imaging on an elongated target such as detector array or monochromator slit**

Cylindrical lenses image a point source as a line. They have magnification in only one plane, therefore they can change the height of an image without changing the width, or vice versa. See Fig. 1 for a diagram

We have Borosilicate Crown Glass and UV grade fused silica cylindrical lenses, in various focal lengths.

#### WHEN DO I USE A CYLINDRICAL LENS?

Cylindrical lenses have unique applications. They are used to:

- Focus a source onto a monochromator slit
- Focus onto linear detector arrays
- Give better system efficiency when the target acceptance cone or shape is not circularly symmetric
- Change a laser beam shape (with some lasers the elongated focus gives better target coupling at lower peak power density)

#### MATERIAL

If you don't need throughput below 330 nm, choose the less expensive borosilicate crown glass lenses. The UV grade fused silica models transmit down to 190 nm. See page 15-8 for transmittance curves for both materials.

To improve transmittance, request the lens with an anti-reflection coating on both sides. We have a broadband single layer ( $\text{MgF}_2$ ) AR coating and multi-layer AR coatings for various narrow spectral regions. Please request the coating at the time of lens purchase.

#### CALCULATING FOCAL LENGTH AT OTHER WAVELENGTHS

The focal lengths specified on the following page are all calculated at 589 nm. To calculate the focal length at other wavelengths refer to page 15-2 for a detailed explanation and formula.

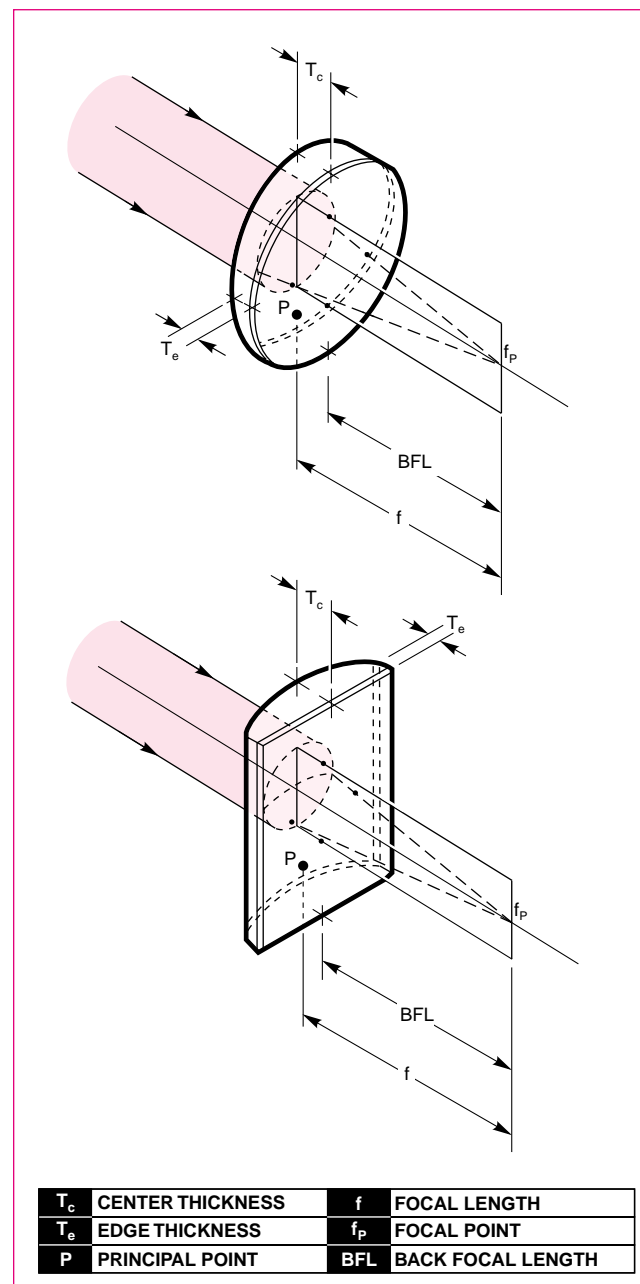


Fig. 1 Circular and Rectangular Cylindrical Lenses.

#### CIRCULAR VS RECTANGULAR LENSES

We offer these lenses in two physical styles: round and rectangular. Performance is the same. Choose the lens that best suits your space. The round lenses fit in any of our standard lens holders described on pages 18-7 to 18-23. The rectangular models need a dedicated lens holder which we describe below.

#### LENS HOLDER FOR RECTANGULAR LENSES

The 1311 Rectangular Lens Holder accepts any rectangular lens up to 2.5 inches (63.5 mm) high and 2.0 inches (50.8 mm) wide. The 1311 is rod mounted and includes a 2.75 inch (70 mm) long optical rod.

## SPECIFICATIONS

Size tolerance:	+0 mm; -0.25 mm	Index of refraction:	
Edge/center thickness tolerance:	±0.25 mm	Glass lenses:	1.5167 @ 589 nm
Edge finish:	Fine ground, beveled	Fused silica lenses:	1.4584 @ 589 nm
Clear aperture diameter/rectangle:	95% of central diameter/rectangle	Surface quality:	60 - 40
		Centration:	3 arc min (0.9 mrad)
Focal length tolerance:	±3%		
Back focal length tolerance:	±3%		
Material:	Select quality Borosilicate Crown Glass (BK 7/A) or UV grade fused silica		

## ORDERING INFORMATION

### Rectangular Cylindrical Lenses

Size inch (mm)	Nominal f @ 589 nm (mm)	Nominal BFL @ 589 nm (mm)	Center Thickness (mm)	Edge Thickness (mm)	Model No.	Price
<b>Borosilicate Crown Glass</b>						
1.0 x 0.63 (25.4 x 16)	25	24.3	4.4	1.66	44005	
1.0 x 1.0 (25.4 x 25.4)	50	48.9	5.4	2.4	44006	
1.0 x 2.0 (25.4 x 50.8)	75	73.1	12.3	2.23	44007	
1.0 x 2.0 (25.4 x 50.8)	100	97.9	9.5	3.3	44008	
1.0 x 2.0 (25.4 x 50.8)	150	148.0	6.9	2.6	44009	
2.5 x 0.65 (63.5 x 16.4)	25	24.2	4.57	1.63	44010	
2.5 x 1.0 (63.5 x 25.4)	50	48.7	5.60	2.10	44020	
2.5 x 2.0 (63.5 x 50.8)	75	72.8	12.75	3.18	44030	
2.5 x 2.0 (63.5 x 50.8)	100	97.6	8.90	2.39	44040	
2.5 x 2.0 (63.5 x 50.8)	150	147.5	6.60	1.98	44050	
<b>Fused Silica Lenses</b>						
1.0 x 0.63 (25.4 x 16)	25	24.2	5.33	2.08	44011	
1.0 x 2.0 (25.4 x 50.8)	75	73.0	13.34	1.57	44013	
1.0 x 2.0 (25.4 x 50.8)	150	147.7	7.62	2.77	44016	
2.5 x 0.65 (63.5 x 16.4)	25	24.2	7.62	4.34	44015	
2.5 x 2.0 (63.5 x 50.8)	75	72.8	13.34	1.57	44035	
2.5 x 2.0 (63.5 x 50.8)	150	147.2	7.62	2.77	44055	

### Circular Cylindrical Lenses

Size inch (mm)	Nominal f @ 589 nm (mm)	Nominal BFL @ 589 nm (mm)	Center Thickness (mm)	Edge Thickness (mm)	Model No.	Price
<b>Borosilicate Crown Glass</b>						
0.75 (19.1)	25	24.3	5.84	1.66	43830	
1.0 (25.4)	50	48.9	5.5	2.4	43840	
1.0 (25.4)	75	73.1	4.45	2.23	43845	
1.0 (25.4)	100	97.9	3.6	2.2	43880	
1.0 (25.4)	150	148.0	2.4	1.39	43885	
2.0 (50.8)	75	72.8	12.75	3.18	43850	
2.0 (50.8)	100	97.6	9.53	2.77	43860	
2.0 (50.8)	150	147.5	6.60	1.98	43870	
<b>Fused Silica Lenses</b>						
0.75 (19.1)	25	24.2	6.7	1.8	43910	
1.0 (25.4)	50	48.9	5.25	1.9	43920	
1.0 (25.4)	75	73.0	4.36	1.9	43922	
1.0 (25.4)	100	97.8	4.0	1.9	43923	
1.0 (25.4)	150	147.7	3.3	2.1	43924	
2.0 (50.8)	75	72.8	13.34	1.57	43930	
2.0 (50.8)	100	97.5	10.16	1.98	43940	
2.0 (50.8)	150	147.2	7.62	2.77	43950	

**1311** Rectangular Cylindrical Lens Holder  
2.75 inch long optical rod included

Lenses

Filters

Polarization  
Optics

Windows,  
Substrates & Mirrors

Prisms &  
Beam Splitters

Optical Coatings

Properties of  
Optical Materials