

Lenses & Microscope Components

Lenses

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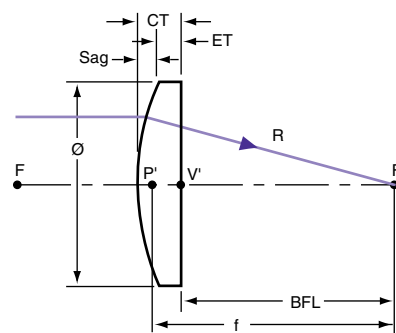
- Laser quality polish
- Antireflection coating available
- Thermally stable for most laser applications

Ealing's line of LaserLenses™ are ideal for most laser applications. They are made of UV grade fused silica which can withstand the thermal heating from a laser beam much better than glass. LaserLenses have excellent transmission down into the UV spectrum and have been precision polished to minimize scatter and wavefront distortion. For optimal transmission, a standard UV AR coating is available.

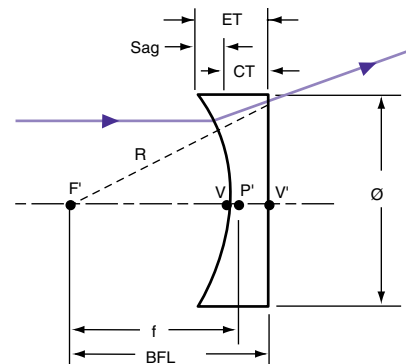


Specifications

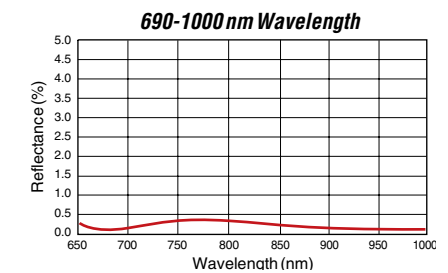
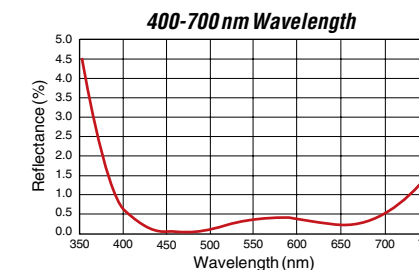
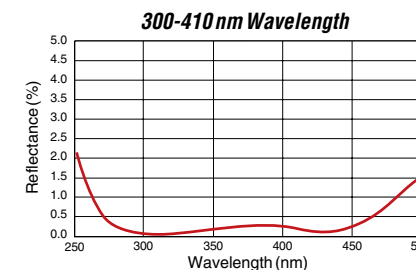
Material: UV grade fused silica
Refractive Index: 1.458 (at 587.6 nm)
Abbe Number V_d : 67.8
Design Wavelength: 532 nm
Focal Length Tolerance: $\pm 0.5\%$
Diameter Tolerance: $+0/-0.127$ mm
Center Thickness Tolerance: ± 0.25 mm
Wedge Angle: < 3 arcmin
Surface Quality: 10-5
Surface Irregularity: $\lambda/10$ @633 nm



Plano-Convex Lens



Plano-Concave Lens



A range of antireflection coatings are also available. Simply select the appropriate coating and add the coating suffix to the LaserLens part number.
 See pages 46-47 for details

LaserLenses™ – Plano-Convex

Focal Length, f (mm)	Diamter, Ø (mm)	Edge Thickness, ET(mm)	Radius (mm)	Uncoated		With UV AR Coating 300-410nm	
				Catalog Number	Price US	Catalog Number	Price US
22.1	12.7	2.0	10.17	43-9109	\$145.00	34-6718	\$185.00
33.1	12.7	2.0	15.26	43-9117	\$145.00	34-6080	\$185.00
55.2	12.7	2.0	25.43	43-9125	\$145.00	34-6098	\$185.00
82.8	12.7	2.0	38.14	43-9133	\$145.00	34-6106	\$185.00
110.4	12.7	2.0	50.85	43-9141	\$145.00	34-6148	\$185.00
220.8	12.7	2.0	101.71	43-9190	\$145.00	34-6999	\$185.00
33.1	25.4	2.0	15.26	43-9216	\$160.00	34-6734	\$200.00
55.2	25.4	2.0	25.43	43-9224	\$160.00	34-6759	\$200.00
82.8	25.4	2.0	38.14	43-9232	\$160.00	34-6114	\$200.00
110.4	25.4	2.0	50.85	43-9240	\$120.00	34-6783	\$160.00
165.6	25.4	2.0	76.28	43-9265	\$120.00	34-6841	\$160.00
220.8	25.4	2.0	101.71	43-9299	\$120.00	34-6932	\$160.00
1103.8	25.4	2.0	508.53	43-9521	\$120.00	-	-

LaserLenses™ – Plano-Concave

Focal Length, f (mm)	Diamter, Ø (mm)	Center Thickness, CT (mm)	Radius (mm)	Uncoated		With UV AR Coating 300-410nm	
				Catalog Number	Price US	Catalog Number	Price US
-22.1	12.7	2.0	10.17	43-9315	\$145.00	43-2930	\$185.00
-33.1	12.7	2.0	15.26	43-9323	\$145.00	43-2948	\$185.00
-55.2	12.7	2.0	25.43	43-9331	\$145.00	43-2955	\$185.00
-110.4	12.7	2.0	50.85	43-9356	\$145.00	43-2971	\$185.00
-220.8	12.7	2.0	101.71	43-9406	\$145.00	43-3029	\$185.00
-331.1	12.7	2.0	152.56	43-9414	\$145.00	43-3037	\$185.00
-55.2	25.4	2.0	25.43	43-9430	\$160.00	43-3052	\$200.00
-110.4	25.4	2.0	50.85	43-9455	\$120.00	43-3078	\$160.00
-220.8	25.4	2.0	101.71	43-9505	\$120.00	43-3128	\$160.00
-331.1	25.4	2.0	152.56	43-9513	\$120.00	43-3136	\$160.00

Plano-Convex Glass Lenses

- **Ideal for infinite conjugate use**
- **Wide range of focal lengths**

These lenses have positive focal lengths. They work best when producing real images at near infinite conjugates or where one of the conjugates is virtual. They outperform the equivalent equi-convex lens if the magnification lies in the range:

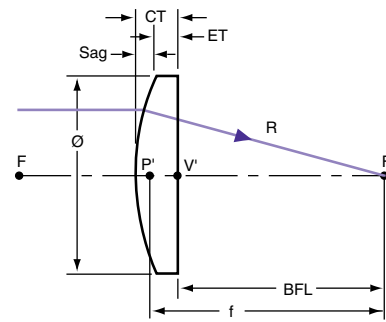
$$m < -5 \text{ or } m > -0.2$$

The optimum orientation for most application is with the curved surface towards the long conjugate.



Specifications

Material: BK7 glass
 Clear Aperture: >85% of diameter
 Focal Length Tolerance: $\pm 0.5\%$
 Diameter Tolerance: $+0 -0.127$ mm
 Center Thickness Tolerance: ± 0.254 mm
 Wedge Angle: < 3 arcmin
 Surface Quality: 10-5
 Surface Irregularity: $\lambda/10 @ 633$ nm
 Uncoated



Fixed Lens Mounts



Fixed lens mounts are also available. See page 129

Plano-Concave Glass Lenses

- **Ideal for infinite conjugate use**
- **Wide range of focal lengths available**

These lenses have negative focal lengths. They are a more suitable choice than the equivalent equi-concave lens if the magnification lies in the range:

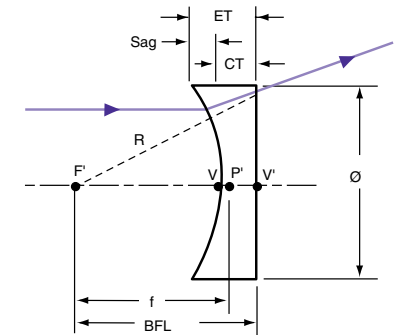
$$m < -5 \text{ or } m > 0.2$$

The optimum orientation for most applications is with the curved surface towards the long conjugate.



Specifications

Material: BK7 glass
 Clear Aperture: >85% of diameter
 Focal Length Tolerance: $\pm 0.5\%$
 Diameter Tolerance: $+0 -0.127$ mm
 Center Thickness Tolerance: ± 0.254 mm
 Wedge Angle: < 3 arcmin
 Surface Quality: 10-5
 Surface Irregularity: $\lambda/10 @ 633$ nm
 Uncoated



Plano-Convex Glass Lenses

Catalog Number	Focal Length, f (mm)	Diameter, Ø (mm)	Radius, R (mm)	Edge Thickness, ET (mm)	Price US
43-0017	20.0	12.7	10.39	2.0	\$30.00
43-0033	30.0	12.7	15.58	2.0	\$30.00
43-0066	50.0	12.7	25.97	2.0	\$30.00
43-0082	75.0	12.7	38.96	2.0	\$30.00
43-0090	100.0	12.7	51.95	2.0	\$30.00
43-0124	200.0	12.7	103.89	2.0	\$30.00
43-0249	30.0	25.4	15.58	2.0	\$32.00
43-0264	50.0	25.4	25.97	2.0	\$32.00
43-0280	75.0	25.4	38.96	2.0	\$32.00
43-0298	100.0	25.4	51.95	2.0	\$32.00
43-0314	150.0	25.4	77.92	2.0	\$32.00
43-0322	200.0	25.4	103.89	2.0	\$32.00
43-0348	300.0	25.4	155.84	2.0	\$32.00
43-0363	500.0	25.4	259.73	2.0	\$32.00
43-0462	75.0	50.8	38.96	2.0	\$40.00
43-0470	100.0	50.8	51.95	2.0	\$40.00
43-0496	150.0	50.8	77.92	2.0	\$40.00
43-0504	200.0	50.8	103.89	2.0	\$40.00
43-0520	300.0	50.8	155.84	2.0	\$40.00
43-0546	500.0	50.8	259.73	2.0	\$40.00
43-0553	750.0	50.8	389.60	2.0	\$40.00
43-0561	1000.0	50.8	519.47	2.0	\$40.00

Plano-Concave Glass Lenses

Catalog Number	Focal Length, f (mm)	Diameter, Ø (mm)	Radius, D (mm)	Center Thickness, CT (mm)	Price US
43-1551	-20.0	12.7	10.39	2.0	\$30.00
43-1577	-30.0	12.7	15.58	2.0	\$30.00
43-1593	-40.0	12.7	20.78	2.0	\$30.00
43-1601	-50.0	12.7	25.97	2.0	\$30.00
43-1635	-100.0	12.7	51.95	2.0	\$30.00
43-1809	-50.0	25.4	25.97	2.0	\$32.00
43-1841	-100.0	25.4	51.95	2.0	\$32.00
43-1874	-200.0	25.4	103.89	2.0	\$32.00
43-1882	-300.0	25.4	155.84	2.0	\$32.00
43-1908	-500.0	25.4	259.73	3.0	\$32.00
43-2013	-100.0	50.8	51.95	3.0	\$40.00
43-2054	-200.0	50.8	103.89	3.0	\$40.00
43-2062	-300.0	50.8	155.84	3.0	\$40.00
43-2088	-500.0	50.8	259.73	5.0	\$40.00
43-2096	-750.0	50.8	389.60	5.0	\$40.00
43-2104	-1000.0	50.8	519.47	5.0	\$40.00

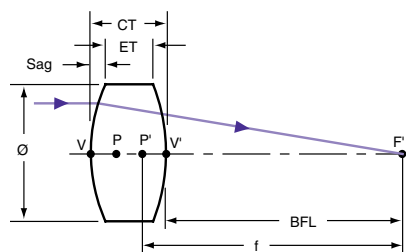
Equi-Convex Glass Lenses

- Ideal for 1:1 imaging
- Wide range of focal lengths available



These lenses have positive focal lengths and are the optimum shape for producing real images at 1:1 magnification. In a single lens application you should consider using them in preference to a single plano-convex lens if the magnification lies in the region:

$$-5 < m < -0.2$$



Specifications

- Material: BK7 glass
- Clear Aperture: >85% of diameter
- Focal Length Tolerance: $\pm 0.5\%$
- Diameter Tolerance: $+0 -0.127$ mm
- Center Thickness Tolerance: ± 0.254 mm
- Wedge Angle: < 3 arcmin
- Surface Quality: 10-5
- Surface Irregularity: $\lambda/10$ @633 nm
- Uncoated

Fixed Lens Mounts



Fixed lens mounts are also available. See page 129

Equi-Convex Glass Lenses

Catalog Number	Focal Length, f (mm)	Diameter, Ø (mm)	Radius, R (mm)	Center Thickness, CT (mm)	Edge Thickness, ET (mm)	Price US
43-0744	14.9	12.7	14.4	6.0	3.0	\$26.00
43-0769	24.8	12.7	25.2	3.6	2.0	\$26.00
43-0819	50.0	12.7	51.0	2.8	2.0	\$26.00
43-0835	99.2	12.7	102.7	2.4	2.0	\$26.00
43-0991	25.0	25.4	24.2	9.2	2.0	\$28.00
43-1023	49.6	25.4	50.6	5.2	2.0	\$28.00
43-1049	74.4	25.4	76.6	4.1	2.0	\$28.00
43-1056	99.3	25.4	102.4	3.6	2.0	\$28.00
43-1080	198.5	25.4	205.6	3.8	3.0	\$28.00
43-1122	495.7	25.4	514.6	4.3	4.0	\$28.00
43-1239	50.4	50.8	49.3	16.1	2.0	\$44.00
43-1254	99.2	50.8	101.6	8.5	2.0	\$44.00
43-1270	148.8	50.8	153.4	8.1	4.0	\$44.00
43-1320	495.2	50.8	514.6	6.3	5.0	\$44.00
43-1346	991.6	50.8	1029.8	2.6	2.0	\$44.00

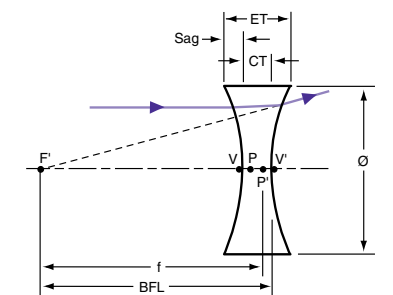
Equi-Concave Glass Lenses

- Useful for beam divergence
- Wide range of focal lengths available



These lenses have negative focal lengths. In a single lens application you should consider using them in preference to a single plano-concave lens if the magnification lies in the region:

$$-5 < m < -0.2$$



Specifications

- Material: BK7 glass
- Clear Aperture: >85% of diameter
- Focal Length Tolerance: $\pm 0.5\%$
- Diameter Tolerance: $+0 -0.127$ mm
- Center Thickness Tolerance: ± 0.254 mm
- Wedge Angle: < 3 arcmin
- Surface Quality: 10-5
- Surface Irregularity: $\lambda/10$ @633 nm
- Uncoated

Equi-Concave Glass Lenses

Catalog Number	Focal Length, f (mm)	Diameter, Ø (mm)	Radius, R (mm)	Center Thickness, CT (mm)	Price US
43-2112	-10.0	12.7	10.8	2.0	\$26.00
43-2369	-25.0	25.4	26.1	2.0	\$28.00
43-2393	-50.0	25.4	51.8	2.0	\$28.00
43-2427	-100.0	25.4	103.4	2.0	\$28.00
43-2450	-250.0	25.4	257.9	2.0	\$28.00
43-2492	-500.0	25.4	515.8	3.0	\$28.00
43-2625	-100.0	50.8	103.4	2.0	\$44.00
43-2666	-250.0	50.8	257.9	5.0	\$44.00
43-2674	-500.0	50.8	515.8	7.0	\$44.00
43-2716	-1000.0	50.8	1030.5	7.0	\$44.00

Aspheric Condenser Lenses

- **Ideal for broadband illumination applications**
- **Low f-number with minimal spherical aberrations**

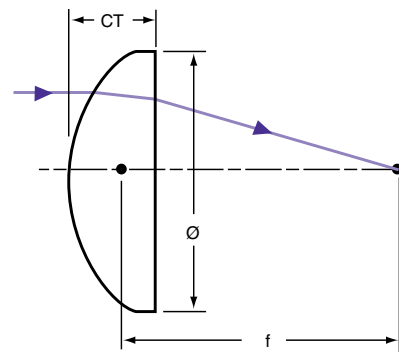


Aspheric lenses have at least one surface that is not a true sphere. The aspheric profile used is frequently a conic surface of revolution about the lens axis, matched in design to the shape

of the second surface. The shape of this lens produces a dramatic reduction of the spherical aberration, even for very low F-numbers.

The lenses listed here have a molded aspheric surface which is firepolished.

These lenses are mainly used in condenser or illumination applications. They are also used where a high light gathering power is needed such as for focusing onto detectors or fibers.



Specifications

Material: B270 optical crown glass
Focal Length Tolerance: ±7%
Diameter Tolerance: +0 -0.4 mm
Center Thickness Tolerance: ±0.5 mm
Surface Quality: Fire polished, 80-50
Uncoated

Condenser Grade Aspheric Lenses

Catalog Number	Focal Length, f (mm)	Diameter, Ø (mm)	Second Surface Shape*	CT (mm)	F-Number	Price US
34-2006	8.5	12.0	CX	5.5	0.71	\$24.00
34-2014	10.5	12.0	P	3.5	0.88	\$22.00
34-2030	12.0	15.0	P	5.5	0.80	\$24.00
34-2055	12.0	18.0	CX	8.8	0.67	\$22.00
34-2063	15.5	18.0	P	7.0	0.86	\$22.00
34-2071	17.0	19.0	P	7.0	0.89	\$22.00
34-2113	20.0	25.0	P	7.5	0.80	\$26.00
34-2154	23.5	30.0	P	11.0	0.78	\$29.00
34-2162	26.5	30.0	P	11.0	0.88	\$29.00
34-2204	34.5	38.0	P	12.0	0.91	\$34.00
34-6338	25.0	40.0	P	16.5	0.65	\$40.00
34-2212	29.5	40.0	CX	15.5	0.74	\$45.00
34-2246	35.0	50.0	P	20.6	0.70	\$55.00
34-2261	39.0	50.0	P	22.5	0.78	\$55.00
34-2287	49.0	50.0	CX	14.3	0.98	\$70.00
34-2352	53.0	65.0	P	23.5	0.82	\$96.00
34-2378	50.0	75.0	P	29.1	0.67	\$140.00

* Note: P=Plano, CX=Convex

Calcium Fluoride Lenses

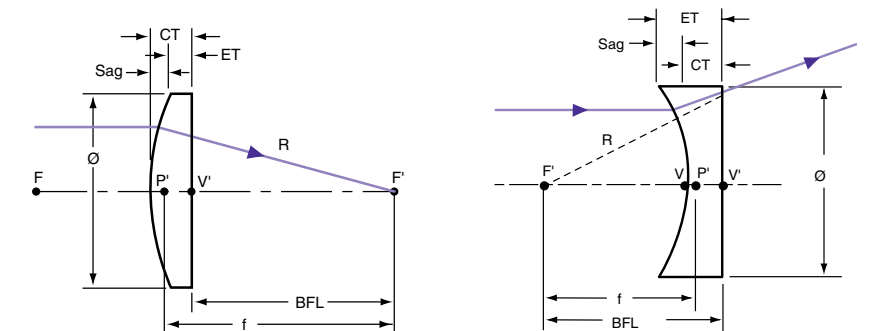
- **Transmission from 150 nm-7 µm**

These lenses are available in plano-convex and plano-concave forms. Calcium fluoride exhibits excellent transmission from 150 nm in the ultraviolet through 7 µm in the infrared. Because of the low refractive index of calcium fluoride, in most cases an antireflection coating is not required.



Specifications

Material: Optical grade calcium fluoride
Refractive index: 1.399 (at 5.0 µm)
Abbe Number V_d : 94.9
Focal Length Tolerance: ±2%
Diameter Tolerance: +0.0 -0.2 mm
Center Thickness Tolerance: ±0.25 mm
Wedge Angle: <5 arcmin
Surface Quality: 60-40
Uncoated



Plano-Convex Lens

Plano-Concave Lens

Plano-Convex Calcium Fluoride Lenses

Catalog Number	Focal Length, f (mm)	Diameter, Ø (mm)	Center Thickness CT (mm)	Edge Thickness ET (mm)	Principal Point V'P' (mm)	Price US
34-3483	50.0	25.4	6.6	2.0	-4.7	\$400.00
34-3491	63.0	25.4	5.4	2.0	-3.9	\$350.00
34-3517	75.0	25.4	4.8	2.0	-3.5	\$300.00
34-3533	100.0	25.4	4.1	2.0	-2.9	\$140.00
34-4929	150.0	25.4	3.4	2.0	-2.4	\$140.00
34-4960	200.0	25.4	3.0	2.0	-2.2	\$140.00
34-4994	250.0	25.4	2.8	2.0	-2.0	\$140.00
34-5017	500.0	25.4	2.4	2.0	-1.7	\$140.00
34-3558	100.0	50.8	11.6	2.5	-8.3	\$500.00
34-4945	150.0	50.8	8.2	2.5	-5.8	\$325.00
34-4978	200.0	50.8	6.6	2.5	-4.8	\$325.00
34-5009	250.0	50.8	5.8	2.5	-4.1	\$250.00
34-5025	500.0	50.8	4.1	2.5	-2.9	\$250.00

Plano-Concave Calcium Fluoride Lenses

Catalog Number	Focal Length, f (mm)	Diameter, Ø (mm)	Center Thickness CT (mm)	Edge Thickness ET (mm)	Principal Point V'P' (mm)	Price US
34-5041	-50.0	25.4	2.5	7.1	-1.8	\$250.00
34-5058	-75.0	25.4	2.5	5.3	-1.8	\$250.00
34-5066	-100.0	25.4	2.5	4.6	-1.8	\$161.00
34-5082	-150.0	50.8	3.0	8.7	-2.1	\$309.00
34-5090	-250.0	50.8	3.0	6.3	-2.1	\$309.00