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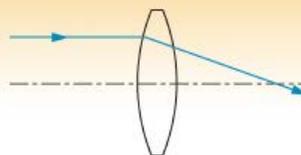


LB4209 - August 23, 2018

Item # LB4209 was discontinued on August 23, 2018. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

UV FUSED SILICA BI-CONVEX LENSES, UNCOATED

- Positive Focal Length for Use at Finite Conjugates
- Zemax Files Available



LB4553
(Ø2")



LB4330
(Ø1")



LB4915
(Ø1/2")



LB4537
(Ø6 mm)



LB4743
(Ø5 mm)

[Hide Overview](#)

OVERVIEW

Features

- 5 Different Diameters Available: Ø5 mm, Ø6 mm, Ø1/2", Ø1", and Ø2"
- Wavelength Range: 185 nm - 2.1 µm (Uncoated)
- Focal Lengths Available from 10.0 - 1000.0 mm
- Fabricated from UV Grade Fused Silica

Thorlabs' UV Grade Fused Silica Bi-Convex Lenses are available here uncoated. UV-grade fused silica offers high transmission in the deep UV and exhibits virtually no laser-induced fluorescence (as measured at 193 nm), making it an ideal choice for applications from the UV to the near IR. In addition, UV fused silica has better homogeneity and a lower coefficient of thermal expansion than N-BK7.

Bi-convex lenses are popular for many finite imaging applications. Both surfaces are spherical and have the same radius of curvature, minimizing aberrations in situations where the object and image distances are equal or nearly equal. As a guideline, bi-convex lenses are the best choice for minimizing aberrations if the conjugate ratio (object distance : image distance) is between 5:1 and 1:5. Outside this range, plano-convex lenses are usually preferred.

Thorlabs offers these bi-convex lenses in sizes ranging from Ø5 mm to Ø2". Each size is compatible with a multitude of Thorlabs lens mounts. Please see the *Mounting Options* tab for details.



Common Specifications*	
Lens Shape	Convex/Convex
Diameters Available	Ø5 mm, Ø6 mm, Ø1/2", Ø1", or Ø2"
Diameter Tolerance	+0.0 mm / -0.1 mm
Substrate Material	UV Grade Fused Silica
Focal Length Tolerance	±1%
Surface Quality	40-20 Scratch-Dig
Spherical Surface Power	3λ/2
Spherical Surface Irregularity	λ/4
Clear Aperture	>90% of Dia.
Design Wavelength	588 nm
Index of Refraction (@ Design λ)	1.460
Centration	≤3 arcmin

*These lenses are also available with AR coatings for wavelength ranges 245 - 400 nm (-UV), 350 - 700 nm (-A), 650 - 1050 nm (-B), and 1050 - 1700 nm (-C).

Bi-Convex Lens Selection Guide		
N-BK7	Uncoated -A (350 - 700 nm)	-B (650 - 1050 nm) -C (1050 - 1700 nm)
Mounted N-BK7	Uncoated -A (350 - 700 nm)	-B (650 - 1050 nm) -C (1050 - 1700 nm)
Best Form UV Fused Silica	Uncoated -UV (245 - 400 nm) -A (350 - 700 nm)	-B (650 - 1050 nm) -C (1050 - 1700 nm)
CaF ₂	Uncoated	-E (3 - 5 µm)
ZnSe		-F (8 - 12 µm)

Custom Coatings are also available. Please contact our technical support staff for

Quick Links to Other Spherical Singlets

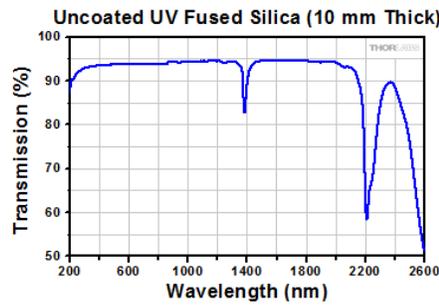
Plano-Convex	Bi-Convex	Negative Meniscus
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a quote.

[Hide Graphs](#)

GRAPHS

Below is the transmission curve for a 10 mm thick uncoated sample of UV fused silica when the incident light is normal to the surface. Please note that this is the measured transmission, including surface reflections.



[Click Here for Raw Data](#)
[Click to Enlarge](#)

[Hide Mounting Options](#)

MOUNTING OPTIONS



[Click to Enlarge](#)
 LMR1 Fixed Mount with
 Ø1" Lens



[Click to Enlarge](#)
 CXY1 Translation Mount
 and
 SM1 Lens Tube Mounted
 in a
 30 mm Cage System



[Click to Enlarge](#)
 LM2XY Translating Mount
 with Ø2" Lens



[Click to Enlarge](#)
 Ø1" Optic Mounted in a
 ST1XY-S XY Translator

Recommended Mounting Options for Thorlabs Lenses		
Item #		Mounts for Ø5 mm to Ø10 mm Optics
Imperial	Metric	
(Various)		Fixed Lens Mounts for Small Optics, Ø5 mm to Ø10 mm
(Various)		Small Optic Adapters for Use with Standard Fixed Lens Mounts, Ø5 mm to Ø10 mm
Item #		Mounts for Ø1/2" (Ø12.7 mm) Optics
Imperial	Metric	
LMR05	LMR05/M	Fixed Lens Mount for Ø1/2" Optics
LM05XY	LM05XY/M	Translating Lens Mount for Ø1/2" Optics
SCP05		16 mm Cage System, XY Translation Mount for Ø1/2" Optics
(Various)		Ø1/2" Lens Tubes, Optional SM05RRC Retaining Ring for High-Curvature Lenses (See Below)
Item #		Mounts for Ø1" (Ø25.4 mm) Optics
Imperial	Metric	
LMR1	LMR1/M	Fixed Lens Mount for Ø1" Optics
LM1XY	LM1XY/M	Translating Lens Mount for Ø1" Optics

ST1XY-S	ST1XY-S/M	Translating Lens Mount with Micrometer Drives (Other Drives Available)
CXY1		30 mm Cage System, XY Translation Mount for Ø1" Optics
(Various)		Ø1" Lens Tubes, Optional SM1RRC Retaining Ring for High-Curvature Lenses (See Below)
Item #		Mounts for Ø2" (Ø50.8 mm) Optics
Imperial	Metric	
LMR2	LMR2/M	Fixed Lens Mount for Ø2" Optics
LM2XY	LM2XY/M	Translating Lens Mount for Ø2" Optics
CXY2		60 mm Cage System, XY Translation Mount for Ø2" Optics
(Various)		Ø2" Lens Tubes, Optional SM2RRC Retaining Ring for High-Curvature Lenses (See Below)
Item #		Adjustable Optic Mounts
Imperial	Metric	
LH1	LH1/M	Adjustable Mount for Ø0.28" (Ø7.1 mm) to Ø1.80" (Ø45.7 mm) Optics
LH2	LH2/M	Adjustable Mount for Ø0.77" (Ø19.6 mm) to Ø2.28" (Ø57.9 mm) Optics
VG100	VG100/M	Adjustable Clamp for Ø0.5" (Ø13 mm) to Ø3.5" (Ø89 mm) Optics
SCL03	SCL03/M	Self-Centering Mount for Ø0.15" (Ø3.8 mm) to Ø1.77" (Ø45.0 mm) Optics
SCL04	SCL04/M	Self-Centering Mount for Ø0.15" (Ø3.8 mm) to Ø3.00" (Ø76.2 mm) Optics
LH160C	LH160C/M	Adjustable Mount for 60 mm Cage Systems, Ø0.50" (Ø13 mm) to Ø2.00" (Ø50.8 mm) Optics
SCL60C	SCL60C/M	Self-Centering Mount for 60 mm Cage Systems, Ø0.15" (Ø3.8 mm) to Ø1.77" (Ø45.0 mm) Optics

Mounting High-Curvature Optics

Thorlabs' retaining rings are used to secure unmounted optics within lens tubes or optic mounts. These rings are secured in position using a compatible spanner wrench. For flat or low-curvature optics, standard retaining rings manufactured from anodized aluminum are available from Ø5 mm to Ø4". For high-curvature optics, extra-thick retaining rings are available in Ø1/2", Ø1", and Ø2" sizes.

Extra-thick retaining rings offer several features that aid in mounting high-curvature optics such as aspheric lenses, short-focal-length plano-convex lenses, and condenser lenses. As shown in the animation to the right, the guide flange of the spanner wrench will collide with the surface of high-curvature lenses when using a standard retaining ring, potentially scratching the optic. This contact also creates a gap between the spanner wrench and retaining ring, preventing the ring from tightening correctly. Extra-thick retaining rings provide the necessary clearance for the spanner wrench to secure the lens without coming into contact with the optic surface.

[Hide Ø5 mm UV Fused Silica Bi-Convex Lenses, Uncoated](#)

Ø5 mm UV Fused Silica Bi-Convex Lenses, Uncoated

Item #	Diameter	Focal Length	Dioptr ^a	Radius of Curvature	Center Thickness	Edge Thickness	Back Focal Length	Reference Drawing
LB4743	5.0 mm	10.0 mm	+100.0	8.8 mm	2.2 mm	1.5 mm	9.2 mm	

Suggested Fixed Lens Mounts: LMR5(M)

- Reciprocal of the Focal Length in Meters

Part Number	Description	Price	Availability
LB4743	f = 10.0 mm, Ø5 mm UV Fused Silica Bi-Convex Lens, Uncoated	\$84.66	Today

[Hide Ø6 mm UV Fused Silica Bi-Convex Lenses, Uncoated](#)

Ø6 mm UV Fused Silica Bi-Convex Lenses, Uncoated

Item #	Diameter	Focal Length	Dioptr ^a	Radius of Curvature	Center Thickness	Edge Thickness	Back Focal Length	Reference Drawing
LB4280	6.0 mm	10.0 mm	+100.0	8.8 mm	2.6 mm	1.5 mm	9.1 mm	
LB4537	6.0 mm	15.0 mm	+66.6	13.4 mm	2.2 mm	1.5 mm	14.2 mm	
LB4738	6.0 mm	20.0 mm	+50.0	18.1 mm	2.0 mm	1.5 mm	19.3 mm	
LB4209	6.0 mm	30.0 mm	+33.3	27.3 mm	1.8 mm	1.5 mm	29.4 mm	

Suggested Fixed Lens Mounts: LMR6(M)

- Reciprocal of the Focal Length in Meters

Part Number	Description	Price	Availability
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LB4280	f = 10.0 mm, Ø6 mm UV Fused Silica Bi-Convex Lens, Uncoated	\$81.09	Today
LB4537	f = 15.0 mm, Ø6 mm UV Fused Silica Bi-Convex Lens, Uncoated	\$80.58	Today
LB4738	f = 20.0 mm, Ø6 mm UV Fused Silica Bi-Convex Lens, Uncoated	\$78.80	Today
LB4209	f = 30.0 mm, Ø6 mm UV Fused Silica Bi-Convex Lens, Uncoated	\$58.40	Lead Time

[Hide Ø1/2" \(12.7 mm\) UV Fused Silica Bi-Convex Lenses, Uncoated](#)

Ø1/2" (12.7 mm) UV Fused Silica Bi-Convex Lenses, Uncoated

Item #	Diameter	Focal Length	Diopter ^a	Radius of Curvature	Center Thickness	Edge Thickness	Back Focal Length	Reference Drawing
LB4854	1/2"	20.0 mm	+50.0	17.7 mm	4.2 mm	1.8 mm	18.5 mm	
LB4003	1/2"	30.0 mm	+33.3	27.1 mm	3.3 mm	1.8 mm	28.8 mm	
LB4700	1/2"	40.0 mm	+25.0	36.3 mm	2.9 mm	1.8 mm	39.9 mm	
LB4915	1/2"	50.0 mm	+20.0	45.6 mm	2.7 mm	1.8 mm	49.1 mm	

Suggested Fixed Lens Mount: LMR05(M)

- Reciprocal of the Focal Length in Meters

Part Number	Description	Price	Availability
LB4854	f = 20.0 mm, Ø1/2" UV Fused Silica Bi-Convex Lens, Uncoated	\$83.13	Today
LB4003	f = 30.0 mm, Ø1/2" UV Fused Silica Bi-Convex Lens, Uncoated	\$77.52	Today
LB4700	f = 40.0 mm, Ø1/2" UV Fused Silica Bi-Convex Lens, Uncoated	\$69.62	Today
LB4915	f = 50.0 mm, Ø1/2" UV Fused Silica Bi-Convex Lens, Uncoated	\$62.73	Today

[Hide Ø1" \(25.4 mm\) UV Fused Silica Bi-Convex Lenses, Uncoated](#)

Ø1" (25.4 mm) UV Fused Silica Bi-Convex Lenses, Uncoated

Item #	Diameter	Focal Length	Diopter ^a	Radius of Curvature	Center Thickness	Edge Thickness	Back Focal Length	Reference Drawing
LB4879	1"	35.0 mm	+28.6	31.0 mm	7.4 mm	2.0 mm	32.4 mm	
LB4030	1"	40.0 mm	+25.0	35.7 mm	6.7 mm	2.0 mm	37.6 mm	
LB4096	1"	50.0 mm	+20.0	45.1 mm	5.7 mm	2.0 mm	48.0 mm	
LB4330	1"	75.0 mm	+13.3	68.3 mm	4.4 mm	2.0 mm	73.5 mm	
LB4941	1"	100.0 mm	+10.0	91.4 mm	3.8 mm	2.0 mm	98.7 mm	
LB4913	1"	125.0 mm	+8.0	114.5 mm	3.4 mm	2.0 mm	123.8 mm	
LB4265	1"	150.0 mm	+6.7	137.5 mm	3.2 mm	2.0 mm	148.9 mm	
LB4282	1"	200.0 mm	+5.0	183.6 mm	2.9 mm	2.0 mm	199.0 mm	
LB4837	1"	250.0 mm	+4.0	229.6 mm	2.7 mm	2.0 mm	249.1 mm	
LB4545	1"	300.0 mm	+3.3	275.6 mm	2.6 mm	2.0 mm	299.1 mm	
LB4453	1"	500.0 mm	+2.0	459.7 mm	2.4 mm	2.0 mm	499.2 mm	
LB4223	1"	750.0 mm	+1.3	689.8 mm	2.2 mm	2.0 mm	749.2 mm	
LB4374	1"	1000.0 mm	+1.0	919.8 mm	2.2 mm	2.0 mm	999.3 mm	

Suggested Fixed Lens Mount: LMR1(M)

- Reciprocal of the Focal Length in Meters

Part Number	Description	Price	Availability
LB4879	f = 35.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$130.56	Today
LB4030	f = 40.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$101.75	Today
LB4096	f = 50.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$96.65	Today
LB4330	f = 75.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$87.98	Today
LB4941	f = 100.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$85.94	Today
LB4913	f = 125.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$83.39	Today
LB4265	f = 150.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$81.09	Today
LB4282	f = 200.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$78.80	Today
LB4837	f = 250.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$77.52	Today
LB4545	f = 300.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$77.01	Today
LB4453	f = 500.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$76.25	Today
LB4223	f = 750.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$75.74	Today

LB4374	f = 1000.0 mm, Ø1" UV Fused Silica Bi-Convex Lens, Uncoated	\$75.48	Today
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[Hide Ø2" \(50.8 mm\) UV Fused Silica Bi-Convex Lenses, Uncoated](#)

Ø2" (50.8 mm) UV Fused Silica Bi-Convex Lenses, Uncoated

Item #	Diameter	Focal Length	Diopter ^a	Radius of Curvature	Center Thickness	Edge Thickness	Back Focal Length	Reference Drawing
LB4592	2"	60.0 mm	+16.7	52.6 mm	15.6 mm	2.5 mm	54.4 mm	
LB4553	2"	75.0 mm	+13.3	67.0 mm	12.5 mm	2.5 mm	70.6 mm	
LB4821	2"	100.0 mm	+10.0	90.4 mm	10.3 mm	3.0 mm	96.4 mm	
LB4140	2"	150.0 mm	+6.7	136.8 mm	7.8 mm	3.0 mm	147.3 mm	
LB4842	2"	200.0 mm	+5.0	183.0 mm	6.5 mm	3.0 mm	197.7 mm	
LB4972	2"	250.0 mm	+4.0	229.1 mm	5.8 mm	3.0 mm	248.0 mm	
LB4710	2"	300.0 mm	+3.3	275.2 mm	5.4 mm	3.0 mm	298.2 mm	
LB4910	2"	500.0 mm	+2.0	459.4 mm	4.4 mm	3.0 mm	498.5 mm	
LB4293	2"	1000.0 mm	+1.0	919.6 mm	3.7 mm	3.0 mm	998.7 mm	

Suggested Fixed Lens Mount: LMR2(/M)

- Reciprocal of the Focal Length in Meters

Part Number	Description	Price	Availability
LB4592	f = 60.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$320.28	Today
LB4553	f = 75.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$292.74	Today
LB4821	f = 100.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$270.30	Today
LB4140	f = 150.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$265.20	Today
LB4842	f = 200.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$250.92	Today
LB4972	f = 250.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$237.66	Today
LB4710	f = 300.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$221.34	Today
LB4910	f = 500.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$207.06	Today
LB4293	f = 1000.0 mm, Ø2" UV Fused Silica Bi-Convex Lens, Uncoated	\$195.84	Today

Visit the [UV Fused Silica Bi-Convex Lenses, Uncoated](#) page for pricing and availability information:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=126