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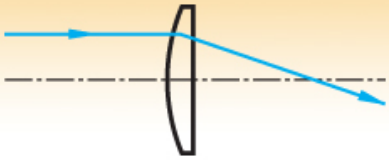
LA4102-633 - March 10, 2025

Item # LA4102-633 was discontinued on March 10, 2025. 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 PLANO-CONVEX LENSES, V-COATED: 633 NM

- **AR V-Coating for 633 nm Deposited on UV-Grade Fused Silica**
- **Near Best Form for Infinite Conjugate Applications**
- **Available in Ø1/2" and Ø1" Versions**



LA4052-633

LA4600-633

LA4765-633

LA4579-633

OVERVIEW

Features

- Material: UV-Grade Fused Silica
- AR V-Coating Centered at 633 nm
- Focal Lengths Available from 20.0 mm - 1000.0 mm

Zemax Files

Click on the red Document icon next to the item numbers below to access the Zemax file download. Our entire Zemax Catalog is also available.

Thorlabs' UV-Grade Fused Silica Plano-Convex lenses are available here with an AR V-Coating centered at 633 nm deposited on both surfaces. These lenses have diameters of Ø1/2" or Ø1". Each size is compatible with a multitude of Thorlabs lens mounts. Please see the *Mounting Options* tab for details.

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.

The V-coating is a multilayer, antireflective, dielectric, thin-film coating that achieves less than 0.25% reflectance over a narrow wavelength range. Reflectance rises rapidly on either side of this minimum, giving the reflectance curve a "V" shape (see *Graphs* tab for performance plots). When compared to broadband AR offerings, dielectric V-coats achieve lower reflectivity over a narrower bandwidth and incident angle.

With a reflectance of less than 0.25% at 633 nm, these V-Coated lenses provide exceptional transmittance and are ideal for use with HeNe lasers, as well as applications where light is transmitted through complex optical systems.

Common Specifications	
Lens Shape	Plano-Convex
Substrate Material	UV-Grade Fused Silica[a]
AR V-Coating	633 nm
Reflectance at 633 nm @ AOI = 0°	<0.25% per Surface
Diameters Available	1/2" or 1"
Diameter Tolerance	+0.00 mm / -0.10 mm
Thickness Tolerance	±0.1 mm
Design Wavelength	587.6 nm
Index of Refraction	1.458 @ 587.6 nm
Surface Quality	20-10 Scratch-Dig
Surface Flatness (Plano Side)	λ/2[b]
Spherical Surface Power (Convex Side)[c]	3λ/2[b]
Surface Irregularity (Peak to Valley)	λ/4[b]
Centration	<3 arcmin
Abbe Number	67.82
Clear Aperture	>90% of Diameter
Focal Length Tolerance	±1%

a. Click Link for Detailed Specifications on the Substrate
b. Where λ = 633 nm
c. Much like surface flatness for flat optics, spherical surface power is a measure of the deviation between the surface of the curved optic and a calibrated reference gauge. This specification is also commonly referred to as surface fit.

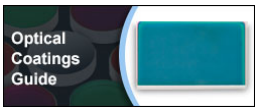
Plano-convex lenses have positive focal lengths and are the most popular type of lens element. They are commonly used to focus a collimated incident beam; in such cases the collimated light source should be incident on the curved surface to minimize spherical aberrations. When image quality is not critical, plano-convex lenses can also be used as a substitute for achromatic doublets.

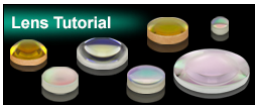
When deciding between a plano-convex lens and a bi-convex lens, both of which cause collimated incident light to converge, it is usually preferable to choose a plano-convex lens if the desired absolute magnification is either less than 0.2 or greater than 5. Between these two values, bi-convex lenses are generally preferred.

Thorlabs offers fixed lens mounts that can be used for mounting the lenses sold here. For mounting high-curvature lenses in select sizes, extra-thick retaining rings with SM05 (0.535"-40) or SM1 (1.035"-40) threading are available that provide extra clearance for spanner wrenches (see the *Mounting Options* tab for more information).

Optics cases are also available for storage of these lenses. Please click here for information.

UVFS Plano-Convex Lens Selection Guide	
Unmounted Lenses	**Mounted Lenses**
Uncoated	Uncoated
-UV Coating (245 - 400 nm)	-UV Coating (245 - 400 nm)
-A Coating (350 - 700 nm)	-A Coating (350 - 700 nm)
-AB Coating (400 - 1100 nm)	-AB Coating (400 - 1100 nm)
T1 Textured Surface (400 - 1100 nm)	T1 Textured Surface (400 - 1100 nm)
-B Coating (650 - 1050 nm)	-B Coating (650 - 1050 nm)
-C Coating (1050 - 1700 nm)	-C Coating (1050 - 1700 nm)
-405 V-Coating (405 nm)	-
-532 V-Coating (532 nm)	-
-YAG V-Coating (532/1064 nm)	-YAG V-Coating (532/1064 nm)
-633 V-Coating (633 nm)	-





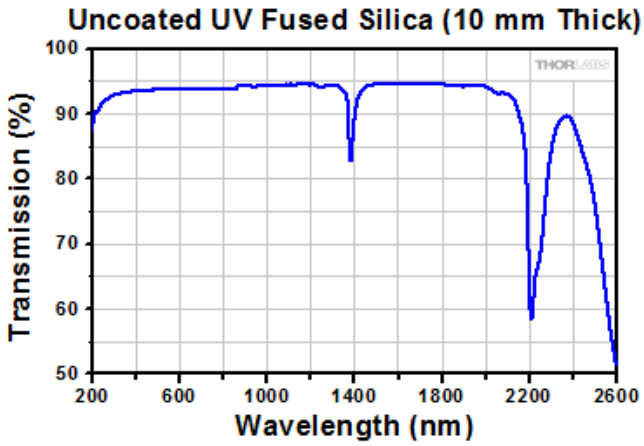
UVFS Plano-Convex Lens Selection Guide	
-1064 V-Coating (1064 nm)	-
-1550 V-Coating (1550 nm)	-

Custom Coatings are also available. Please contact Tech Sales for a quote.

Quick Links to Other Spherical Singlets						
Plano-Convex	Bi-Convex	Best Form	Plano-Concave	Bi-Concave	Positive Meniscus	Negative Meniscus

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 to Enlarge

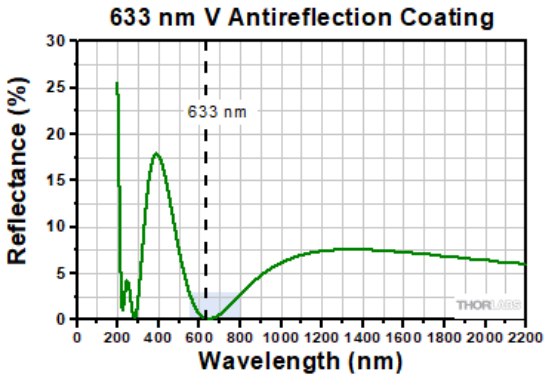
Click Here for Raw Data

V-Coating:

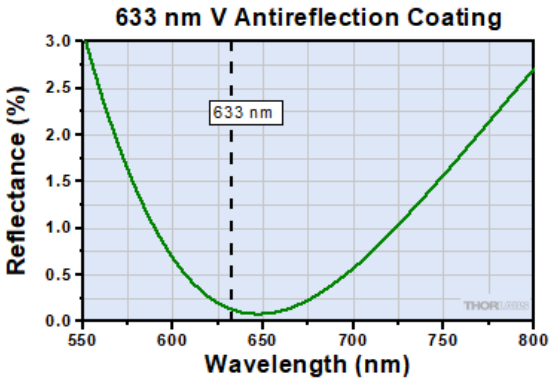
The V-coating is a multilayer, anti-reflective, dielectric thin-film coating designed to achieve minimal reflectance over a narrow band of wavelengths. Reflectance rises rapidly on either side of this minimum, giving the reflectance curve a “V” shape, as shown in the following performance plots. Thorlabs' V-coats have a minimum reflectance of less than 0.25% per surface and are designed for angles of incidence (AOI) between 0° and 20°. Compared to the broadband AR coatings, V-coatings achieve lower reflectance over a narrower bandwidth when used at the specified AOI. Click here for the raw data.

633 nm V-Coat Reflectance (AOI: 0 - 20°)

The plot on the right is an enlarged view of the shaded region:



Click to Enlarge



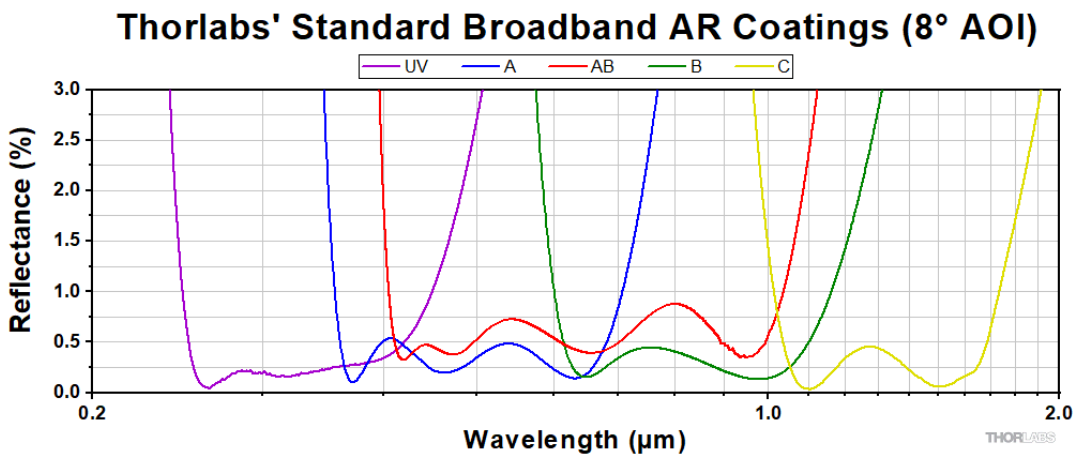
Click to Enlarge

Other AR Coatings:

Thorlabs offers UV-grade fused silica lenses with other V-coatings:

- -405 V-Coating (405 nm)
- -YAG V-Coating (532/1064 nm)
- -532 V-Coating (532 nm)
- -633 V-Coating (633 nm)
- -1064 V-Coating (1064 nm)
- -1550 V-Coating (1550 nm)

They are also available from stock with the UV, visible, or NIR AR coatings shown in the graph below. Click here to view all coating options for UV-grade fused silica plano-convex lenses.


Thorlabs' Standard Broadband AR Coatings (8° AOI)
UV
A
AB
B
C
Reflectance (%)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.2
1.0
2.0
Wavelength (µm)
THORLABS

MOUNTING OPTIONS

Click to Enlarge
Figure 82A LMR1 Fixed Mount with Ø1" Lens

Click to Enlarge
Figure 82B CXY1A Translation Mount and SM1 Lens Tube Mounted in a 30 mm Cage System

Click to Enlarge
Figure 82C LM2XY Translating Mount with Ø2" Lens

Click to Enlarge
Figure 82D Ø1" Optic Mounted in a ST1XY-S XY Translator

Recommended Mounting Options for Thorlabs Lenses		
Item #		**Mounts for Ø2 mm to Ø10 mm Optics**
Imperial	**Metric**	
(Various)		Fixed Lens Mounts and Mini-Series Fixed Lens Mounts for Small Optics, Ø5 mm to Ø10 mm
(Various)		Small Optic Adapters for Use with Standard Fixed Lens Mounts, Ø2 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
MLH05	MLH05/M	Mini-Series 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)
CXY1A		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 #		**Mount for Ø1.5" Optics**
Imperial	**Metric**	
LMR1.5	LMR1.5/M	Fixed Lens Mount for Ø1.5" Optics
(Various)		Ø1.5" Lens Tubes, Optional SM1.5RR Retaining Ring for Ø1.5" Lens Tubes and Mounts
Item #		**Mounts for Ø2" (Ø50.8 mm) Optics**
Imperial	**Metric**	
LMR2	LMR2/M	Fixed Lens Mount for Ø2" Optics

Recommended Mounting Options for Thorlabs Lenses		
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
LH160CA	LH160CA/M	Adjustable Mount for 60 mm Cage Systems, Ø0.50" (Ø13 mm) to Ø2.00" (Ø50.8 mm) Optics
SCL60CA	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.

Ø1/2" UV Fused Silica Plano-Convex Lens, V-Coated: 633 nm

Item #[a]	Diameter	Focal Length	Diopter[b]	Radius of Curvature	Center Thickness	Edge Thickness	Back Focal Length	Reference Drawing
LA4647-633	1/2"	20 mm	+50.0	9.2 mm	4.3 mm	2.0 mm	17.1 mm	
LA4936-633	1/2"	30 mm	+33.3	13.8 mm	3.4 mm	1.9 mm	27.8 mm	
LA4130-633	1/2"	40 mm	+25.0	18.4 mm	2.9 mm	1.9 mm	38.1 mm	
LA4765-633	1/2"	50 mm	+20.0	23.0 mm	2.7 mm	1.9 mm	48.3 mm	
LA4327-633	1/2"	75 mm	+13.3	34.5 mm	2.4 mm	1.8 mm	73.6 mm	
LA4600-633	1/2"	100 mm	+10.0	46.0 mm	2.2 mm	1.8 mm	98.8 mm	

a. Suggested Fixed Lens Mounts: LMR05(/M)
b. Reciprocal of the Focal Length in Meters

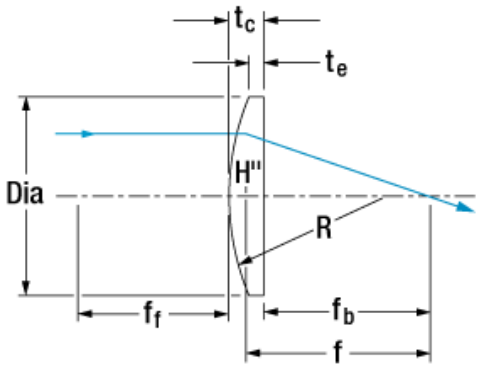
Part Number	Description	Price	Availability
LA4647-633	**Customer Inspired! f = 20 mm, Ø1/2" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$122.51**	**Today**
LA4936-633	**Customer Inspired! f = 30 mm, Ø1/2" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$117.58**	**Today**
LA4130-633	**Customer Inspired! f = 40 mm, Ø1/2" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$117.58**	**Today**
LA4765-633	**Customer Inspired! f = 50 mm, Ø1/2" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$112.14**	**Today**
LA4327-633	**Customer Inspired! f = 75 mm, Ø1/2" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$112.14**	**Today**
LA4600-633	**Customer Inspired! f = 100 mm, Ø1/2" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$112.64**	**Today**

Ø1" UV Fused Silica Plano-Convex Lens, V-Coated: 633 nm

Item #[a]	Diameter	Focal Length	Diopter[b]	Radius of Curvature	Center Thickness	Edge Thickness	Back Focal Length	Reference Drawing
LA4052-633	1"	35 mm	+28.6	16.1 mm	8.2 mm	2.2 mm	29.5 mm	
LA4306-633	1"	40 mm	+25.0	18.4 mm	7.1 mm	2.2 mm	35.3 mm	
LA4148-633	1"	50 mm	+20.0	23.0 mm	5.8 mm	2.1 mm	46.2 mm	
LA4725-633	1"	75 mm	+13.3	34.5 mm	4.4 mm	2.1 mm	72.2 mm	
LA4380-633	1"	100 mm	+10.0	46.0 mm	3.8 mm	2.1 mm	97.7 mm	
LA4236-633	1"	125 mm	+8.0	57.5 mm	3.4 mm	2.1 mm	123.1 mm	
LA4874-633	1"	150 mm	+6.7	69.0 mm	3.2 mm	2.0 mm	148.4 mm	
LA4924-633	1"	175 mm	+5.7	80.5 mm	3.0 mm	2.0 mm	173.6 mm	
LA4102-633	1"	200 mm	+5.0	92.0 mm	2.9 mm	2.0 mm	198.7 mm	
LA4158-633	1"	250 mm	+4.0	115.0 mm	2.7 mm	2.0 mm	249.0 mm	
LA4579-633	1"	300 mm	+3.3	138.0 mm	2.6 mm	2.0 mm	299.3 mm	
LA4184-633[c]	1"	500 mm	+2.0	230.0 mm	2.4 mm	2.0 mm	500.2 mm	
LA4716-633[c]	1"	750 mm	+1.3	345.1 mm	2.2 mm	2.0 mm	751.1 mm	
LA4663-633[c]	1"	1000 mm	+1.0	460.1 mm	2.2 mm	2.0 mm	1002.0 mm	

a. Suggested Fixed Lens Mounts: LMR1(/M)
b. Reciprocal of the Focal Length in Meters
c. The engraved arrow on lens edge points toward the curved surface.

Part Number	Description	Price	Availability
LA4052-633	**Customer Inspired! f = 35 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$138.32**	**Today**
LA4306-633	**Customer Inspired! f = 40 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$138.32**	**Today**
LA4148-633	**Customer Inspired! f = 50 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$138.32**	**Today**
LA4725-633	**Customer Inspired! f = 75 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$132.40**	**Today**
LA4380-633	**Customer Inspired! f = 100 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$132.40**	**Today**
LA4236-633	**Customer Inspired! f = 125 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$127.45**	**Today**
LA4874-633	**Customer Inspired! f = 150 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$127.45**	**Today**
LA4924-633	**Customer Inspired! f = 175 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$127.45**	**Today**
LA4102-633	**Customer Inspired! f = 200 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$127.45**	**Today**
LA4158-633	**Customer Inspired! f = 250 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$127.45**	**Today**
LA4579-633	**Customer Inspired! f = 300 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$138.32**	**Today**
LA4184-633	**Customer Inspired! f = 500 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$138.32**	**Today**
LA4716-633	**Customer Inspired! f = 750 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$138.32**	**Today**
LA4663-633	**Customer Inspired! f = 1000 mm, Ø1" UVFS Plano-Convex Lens, 633 nm V-Coat**	**$138.32**	**Today**



Dia: Diameter
f: Focal Length
f_f: Front Focal Length
f_b: Back Focal Length
R: Radius of Curvature
t_c: Center Thickness
t_e: Edge Thickness
H'': Back Principal Plane