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THORLABS

CSX122-A - November 14, 2016

Item # CSX122-A was discontinued on November 14, 2016. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

MOLDED PLASTIC ASPHERIC LENSES (AR COATING: 400 - 700 nm)

- **Optical-Grade Plastic**
- **Near-Diffraction-Limited Performance**
- **AR Coated for 400 - 700 nm**

CSX122-A

CAX183-A

CAX100-A

CAY046-A

A Laser Diode is Collimated Using a CAY046 Plastic Aspheric Lens in an SM1AD8 Adapter Mounted to an LDM21 Laser Diode Mount

Hide Overview

OVERVIEW

Features

- Material: Optical-Grade Plastic
- Outer Diameters of 5.20 mm, 6.28 mm, and 7.40 mm Available
- Effective Focal Lengths from 4.60 mm to 18.15 mm
- AR Coated for 400 - 700 nm

Our Plastic Aspheric Lenses, which are available uncoated or with an antireflection coating for the 400 - 700 nm range deposited on both sides, utilize molding technology to produce all-plastic, near-diffraction-limited optics. Designed by Philips for high-volume applications at affordable prices, these optics are ideal for low-power applications requiring lightweight components. The surface of the aspheric lens is designed to reduce spherical aberration, which allows for the spot size and collimation of a monochromatic beam of light to be nearly diffraction limited.

In laser diode systems, difficulties with aberration correction are compounded by the beam's high divergence angle. Since individual spherical lenses can refract light at only small angles before spherical aberration is introduced, multiple elements are often required to collimate laser diode light. In contrast, a single aspheric lens collimates without introducing spherical aberration. When used to collimate or focus light, the lens should be oriented so that the side with a larger radius of curvature (i.e., the flatter surface) faces the point source.

Conversely, when coupling light into fiber, it is often necessary to focus the laser light to a near-diffraction-limited spot. With single spherical elements, spherical aberration is the limiting factor to achieving such a small spot size, rather than the diffraction limit. Because these aspheric lenses are corrected to minimize the spherical aberration, the focal spot size can approach the diffraction limit.

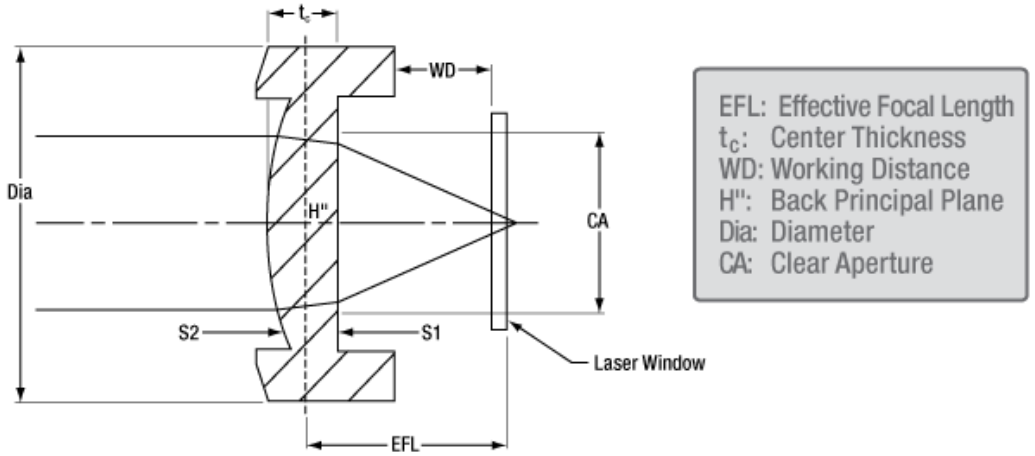
All of the plastic aspheric lenses on this page are corrected for the presence of a window, like the window in TO-type laser packages. Please see the *Specs* tab for details. Additionally, the side of each lens has a flat indent that provides a reference location.

Hide Specs

SPECS

Item #	CAY046-A	CAW100-A	CAX100-A	CAW110-A	CSX122-A	CAX183-A
Effective Focal Length[a]	4.60 mm	9.85 mm	10.00 mm	10.92 mm	12.20 mm	18.15 mm
Numerical Aperture	0.40	0.195	0.20	0.19	0.12	0.12
Clear Aperture	Ø3.7 mm	Ø3.4 mm / Ø3.9 mm (S1 / S2)[c]	Ø4.1 mm	Ø4.1 mm	Ø3.0 mm	Ø4.3 mm
Working Distance[a]	3.00 mm	4.69 mm	8.48 mm	9.3 mm	10.35 mm	16.30 mm
Outer Diameter	7.40 mm	5.20 mm	6.28 mm	6.28 mm	6.28 mm	6.28 mm
Center Thickness[a]	2.70 mm	2.52 mm	1.25 mm	2.44 mm	1.27 mm	1.09 mm
AR Coating Range	400 - 700 nm					
Reflectance Over Coating Range (Avg.)	<0.5% @ 0° AOI					
Wavefront Error, On Axis[b] **(RMS)**	0.040λ	0.040λ	0.080λ	0.040λ	0.095λ	0.030λ
Wavefront Error, Total[b] **(RMS)**	0.070λ	0.050λ	0.090λ	0.055λ	0.095λ	0.035λ
Surface Quality	80-50 Scratch-Dig					
Material	Acrylic	Cyclic Olefin Copolymer	Polycarbonate	Cyclic Olefin Copolymer	Polycarbonate	Polycarbonate
Design Wavelength	670 nm	785 nm	670 nm	670 nm	670 nm	785 nm
Laser Window Correction	0.25 mm (N-BK7)	5 mm (SF11)	0.25 mm (N-BK7)	0.25 mm (N-BK7)	0.25 mm (N-BK7)	0.25 mm (N-BK7)
Operating Temperature	5 to 65 °C	0 to 65 °C	0 to 65 °C	-10 to 75 °C	-10 to 75 °C	-10 to 75 °C
Storage Temperature	-10 to 70 °C	0 to 65 °C	0 to 65 °C	-25 to 100 °C	-25 to 100 °C	-25 to 100 °C

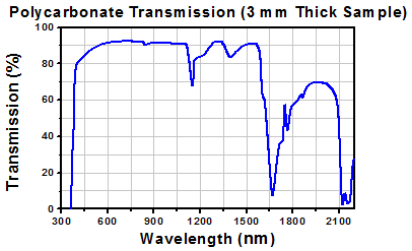
- Measured as Shown in the Diagram Below
- Measured at the Design Wavelength
- As Labeled in the Diagram Below



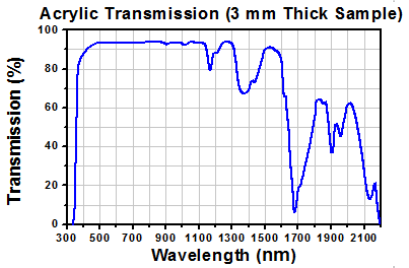
Please note the effective focal length is determined from the back principal plane, which does not coincide with the flat surface of the lens.

Hide Graphs

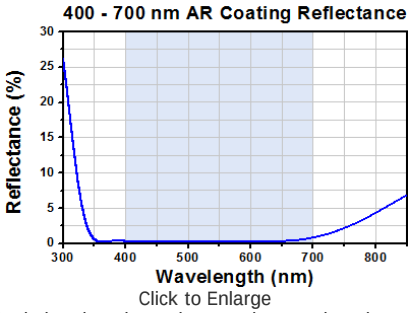
GRAPHS



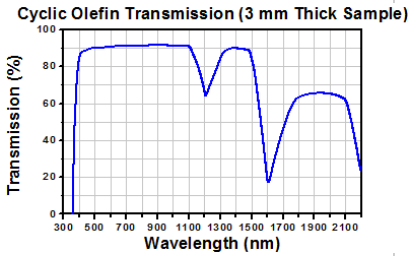
Click to Enlarge
The transmission curve above shows total transmission through uncoated polycarbonate, including surface reflections. Our CAX100-A, CSX122-A, and CAX183-A plastic aspheric lenses are fabricated from this material and then an antireflection coating for 400 to 700 nm is deposited on the surface.



Click to Enlarge
The transmission curve above shows total transmission through uncoated acrylic, including surface reflections. Our CAY046-A plastic aspheric lens is fabricated from this material and then an antireflection coating for 400 to 700 nm is deposited on the surface.



Click to Enlarge
The shaded region above denotes the wavelength range for which these are specified.



Click to Enlarge
The transmission curve above shows total transmission through uncoated cyclic olefin copolymer, including surface reflections. Our CAW110-A and CAW100-A plastic aspheric lenses are fabricated from this material and then an antireflection coating for 400 to 700 nm is deposited on the surface.

Hide Part Numbers

Part Number	Description	Price	Availability
CAY046-A	Plastic Aspheric Lens, Ø7.40 mm, f = 4.60 mm, 0.40 NA, AR Coating: 400 - 700 nm	$20.00	Today
CAW100-A	Plastic Aspheric Lens, Ø5.20 mm, f = 9.85 mm, 0.195 NA, AR Coating: 400-700 nm	$20.00	Today
CAX100-A	Plastic Aspheric Lens, Ø6.28 mm, f = 10.00 mm, 0.20 NA, AR Coating: 400 - 700 nm	$20.00	Today
CAW110-A	Plastic Aspheric Lens, Ø6.28 mm, f = 10.92 mm, 0.19 NA, AR Coating: 400 - 700 nm	$20.00	Today
CSX122-A	Plastic Aspheric Lens, Ø6.28 mm, f = 12.20 mm, 0.12 NA, AR Coating: 400 - 700 nm	$20.00	Today
CAX183-A	Plastic Aspheric Lens, Ø6.28 mm, f = 18.15 mm, 0.12 NA, AR Coating: 400 - 700 nm	$20.00	Today

Visit the *Molded Plastic Aspheric Lenses (AR Coating: 400 - 700 nm)* page for pricing and availability information:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=7027