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THORLABS

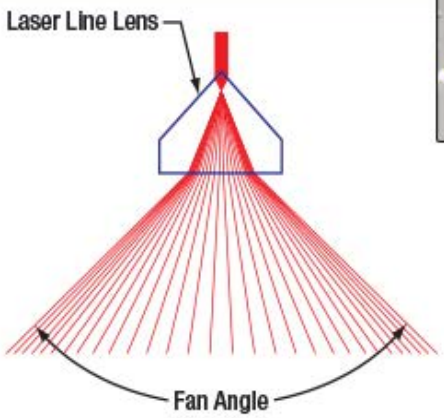
PL0175 - December 20, 2017

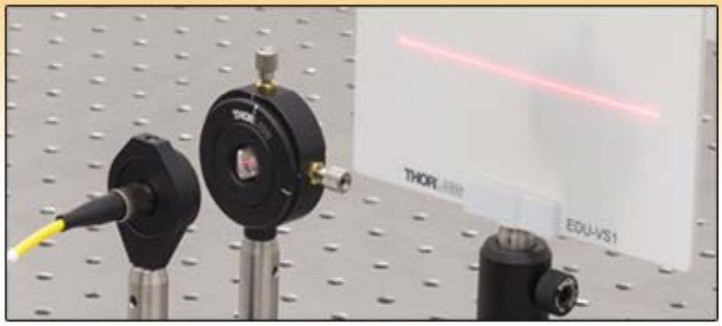
Item # PL0175 was discontinued on December 20, 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

LASER LINE GENERATOR LENS

- **Uniform Laser Line with Nearly Flat Top Profile**
- **Output Fan Angle of 75°**
- **Designed for a Ø0.8 mm Beam at 633 nm**

PL0175





Application Idea

PL0175 Laser Line Lens Used to Produce a Uniform Line from an S1FC635 Laser Source that is Collimated Using an F230FC-B Fiber Collimator

OVERVIEW

Features

- Produce a Uniform, Diverging Laser Line
- 75° Divergence Fan Angle
- Designed for a Ø0.8 mm Beam at 633 nm
- Uniform Line Intensity Within 30%

The PL0175 Laser Line Generator Lens, also known as a Powell lens, generates a straight, uniform laser line by fanning out a collimated beam in one dimension, as shown in the diagram above. The apex of the lens features an aspheric curve that evenly distributes the optical power, resulting in an intensity variation of less than 30% over the center portion of the line. This can be contrasted with standard cylindrical lenses, which can be used to produce diverging laser lines with Gaussian intensity profiles. The relative shape of laser lines with uniform and Gaussian intensity profiles can be seen in the image to the right.

Click to Enlarge
Uniform Laser Line Produced by a Laser Line Lens (Top) and Gaussian Laser Line Produced by a Cylindrical Lens (Bottom)

Click to Enlarge
PL0175 Line Generator Lens in an AD9.5F Adapter Mounted in an LM1XY Translation Mount

This lens has an output fan angle of 75°, and is designed for use at 633 nm with an input beam diameter of 0.8 mm ($1/e^2$). To achieve this beam diameter using a fiber-coupled light source, we recommend using our F230FC-B Fixed Focus Fiber Collimation Package. A plot of the typical laser line intensity profile can be found in the *Specs* tab. This laser line generator lens is produced from N-SF6 glass substrate.

The PL0175 can be mounted by using our LMRA9 adapter for Ø9 mm optics, which would then be mounted into a Ø1/2" mount; this solution requires the lens to be epoxied into the adapter. Alternatively, the lens can be secured in the SM1-threaded AD9.5F adapter without the need for epoxy. Please note that this lens is very sensitive to misalignment, and that great care should be taken when aligning the incoming beam over the apex of the lens. Therefore, we

recommend securing this mounting adapter in a translation mount, such as the post-mountable LM1XY or LM1XY/M.

SPECS

Item #	PL0175
Design Wavelength	633 nm
Input Beam Diameter ($1/e^2$)	0.8 mm
Fan Angle	75°
Fan Angle Tolerance	±3%
Line Intensity Variation[a]	<30%
Typical Line Intensity Data (Click for Graph)	
Line Straightness	<0.1%[b]
Contained Power	80% ± 5%[b]
Lens Diameter	Ø8.89 mm
Lens Diameter Tolerance	+0.00/-0.13 mm
Clear Aperture	>Ø5.8 mm
Centration	<15 arcmin
Surface Quality	40-20 Scratch-Dig
Suggested Mounting Adapters	LMRA9, AD9.5F

- Defined as the peak-to-valley difference in intensity over the center portion of the line containing 80% of the optical power.
- Defined over the central 80% of the line's width.

Part Number	Description	Price	Availability
PL0175	Customer Inspired!Laser Line Generating Lens, 75° Fan Angle, N-SF6	$143.00	Lead Time