

# Light Tunnel Generator

## Overview:

Save costs by improving the efficiency and effectiveness of high power laser cutting. Use the PowerPhotonic Light Tunnel Generator to create a ring shaped spot that is maintained over such a long distance that it creates a light tunnel.

Light Tunnel Generators from PowerPhotonic are thin glass windows with a unique (patent applied for) precision freeform surface that are designed to be mounted inside a cutting or welding head.

They are a perfect solution to the problem of creating a ring shaped intensity profile that persists over 10's of mm - far into metal that is being laser cut (or welded).

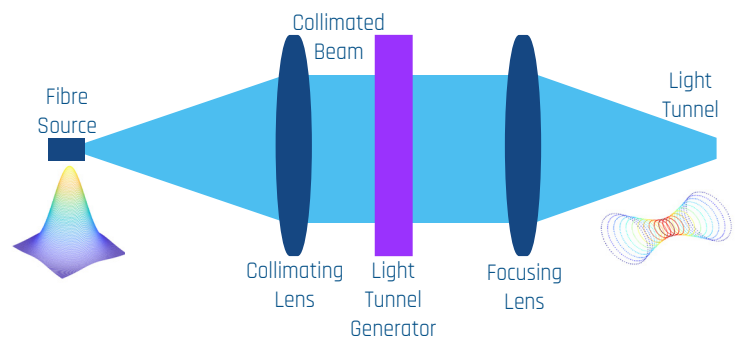
We have standard products for collimated high power fiber lasers operating at 1070nm up to 20kW CW power.

Our design and manufacturing process makes it easy for variations of standard products to be created. We can quickly modify designs to work for different beam diameters up to 50mm and/or to work in diverging (or converging) beams.

## How it works:

The PowerPhotonic Light Tunnel Generator (LTG) is designed to work in a collimated beam, within an existing laser cutting (or welding) head.

The input beam is assumed to be super-Gaussian in profile and to be matched to the design input diameter. The beam shaper then re-distributes energy within the beam, such that when the beam is focussed with a lens, it creates a ring, that extends many times longer along the optical axis than other ring generators (such as an axicon).



## The PowerPhotonic effect:

**>95%**

Shaping Efficiency

**>20kW**

CW Power Handling

**3x DoF**

Comparative to Rayleigh Range of Axicon

## Key Features:

- Efficient beam conversion
- High power handling
- Cost effective
- Customisable for wavelength
- Customisable for beam size

## Target Applications:

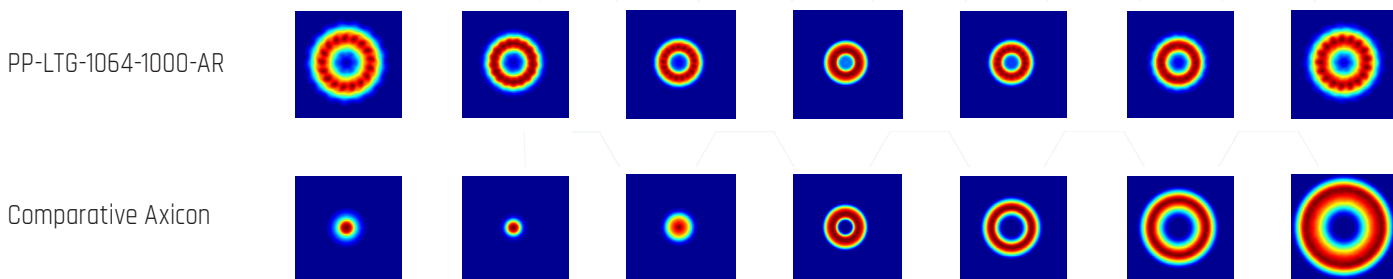
- Laser Cutting
- Laser Welding
- Laser Drilling

## Standard Product: Light Tunnel Generator

Part Number	Clear Aperture (mm)	Output Ring Diameter ( $\mu\text{m}$ )	Output Ring Thickness ( $\mu\text{m}$ )	Through Focus Range (mm)
PP-LTG-1064-500-AR	25	500	200	$\pm 7.5$
PP-LTG-1064-600-AR	25	600	200	$\pm 7.5$
PP-LTG-1064-1000-AR	25	1000	200	$\pm 7.5$

Design Wavelength is 1064nm

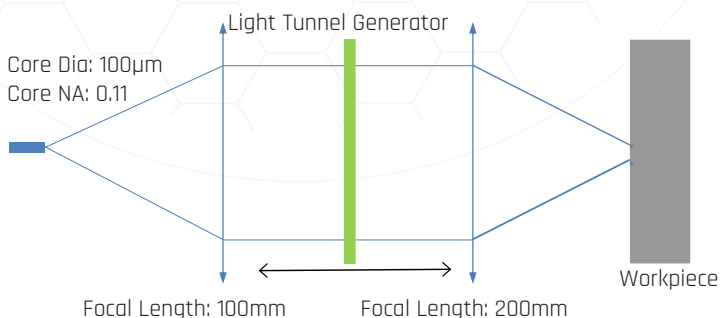
### Through Focus Performance:



### General Specifications:

Parameter	Value
Part Diameter (mm)	30+0/-0.1
Part Thickness (mm)	3 $\pm$ 0.05
Coating Wavelength Band (nm)	1025-1100
Coating Reflectance (%)	<0.5

### Standard Optical Layout:



### Custom Options:

Standard product designs can be readily modified for specific applications. Custom options include: different input beam diameter, different wavelength (in the window between 350nm and 2 $\mu\text{m}$ ) and different optic diameter & thickness. Designs to work in diverging or converging beams are available.

### Sales and Technical:

#### Japan

yoshiyuki.mori@powerphotonic.com

+81 80 1398 0331

www.powerphotonic.com  
sales@powerphotonic.com

#### North America

PowerPhotonic Inc.

16220

S. La Cañada Drive

Sahaurita

AZ 85629

United States

#### United Kingdom

PowerPhotonic Ltd.

5A St. David's Drive,

Dalgety Bay

Fife

KY11 9PF

+44 1383 825 910

