

3.1.2 Beam Profiler Finder

Finding the proper beam profiler and associated accessories to meet your beam profiling needs has never been easier. With our Beam Profiler Finder program just enter your laser parameters and the proper profilers for your application along with recommended accessories will be displayed on the screen. The program calculates the power and energy density capabilities of components, based on the laser wavelength, pulse length, repetition rate and other relevant parameters. It also compares all the other requirements such as the required aperture at every point based on the beam size, maximum and minimum power, energy etc.

In addition to finding the right profiler solution for your application, the Beam Profiler Finder Program offers the following features:

- E mailing of report
- Calculation of input power and energy density and average power
- Tips on further action if no solution is found

Order of Selection

The sensors are selected in terms of cost effectiveness and ease of use, i.e. cost of the total solution balanced against ease of use and quality of profile.

Aperture

Since it is not practical to allow the beam to fill the entire aperture, the sensors are selected so that the sensor aperture is always at least 2mm or 10% larger than the beam and in the case of a Gaussian beam, 1.5 times the Gaussian beam diameter to insure that 99% of the beam is inside the aperture. If the beam is rectangular its corners may touch the aperture. The aperture is checked all along the beam path from the attenuators thru the beam expander / reducer and thru the camera.

Using the Beam Profiler Finder Program

The Beam Profiler Finder Program is available for use online on the Ophir website at the Beam Profiler section.

Beam Profiler Finder Input Screen

The screenshot shows the 'Beam Profiler Finder Input Screen' with the following details:

- Step 1 Measurement Type:** Beam Profile, M Squared - Beam Propagation
- Step 2 Laser Beam Criteria:**
 - Laser:** CW, Pulsed
 - Beam:** Gaussian, Flat-Top
 - Measurement:** Average Only, Every Pulse
 - Beam Parallel?:** Yes or divergence <math>< 1^\circ</math>, Converging, Divergent
- Step 3 Enter Laser Parameters:**
 - 1/e² Diameter at focusing lens (mm): 10
 - Wavelength: 1070 nm
 - Energy Range - Min to Max: 10 to 100 mJ
 - Power Range - Min to Max: (empty)
 - Distance From Lens to Focal Spot mm: 150
 - Focal Spot Diameter in μm : 60
 - Max Rep Rate: 10 Hz
 - Pulse Width: 7 s
- Step 4:**
 - Max. Power Density at Source W/cm²: 2.55
 - Max. Energy Density J/cm²: 0.25
 - Average Power W: 1

1. When the program is started, the above screen appears: In Step 1, Select Measurement type : "Beam Profile" or "M² - Beam Propagation".
2. In Step 2 select the laser type [CW or pulsed], the beam type [flat top or Gaussian and if flat top, circular or rectangular] and whether the beam is parallel, converging or diverging. If converging and you intend to measure the focal spot, you must input the beam size at the focusing lens and the distance from the lens to the focal spot. Note that a divergent beam is one typically from a LED or VECSEL. Enter No if the beam is slightly divergent but basically parallel. Also, if the beam profiler cannot be inserted close to the focusing lens, enter the distance from nearest practical approach and the beam diameter at that point.
3. In Step 3, Enter the required laser parameters: beam diameter, wavelength, max/min power or max/min energy, rep rate and pulse width. If minimum power / energy is not entered, then the program assumes the minimum is 1/2 of the maximum.
4. In Step 4 click "Find Beam Profiler".

4. The combination of beam profilers and accessories that meet specified criteria will be listed in the output screen shown below. The input parameters are listed on top.
5. If you click on the light blue tinted items in the output, you will be sent to the appropriate web page on that item.
6. To email the results, fill in your email and click Email.

Beam Profiler Finder Output Screen

Results For:
 Power Only | Gaussian | $1/(e^{-2})$ Diameter at focusing lens 10mm | Energy Range 10mJ to 100mJ | Wavelength 1070nm | Rep Rate 10Hz | Pulse Width 7ns | Focal Length 150mm | Focal Spot Sizes 60um

#	Model	Description	Accessories Needed
1	SP920s or SP920G or LT665	Si camera standard	LBS300s-NIR SP90466 Adj 1 or 2 ND3 filter SP208253
2	SP907 or SP920s	Si Camera	X4 expander SPZ17022 or X6 expander SPZ08257 LBS300s-NIR SP90466

Email results to:

If you want to measure the power or energy of your beam, use the sensor finder here

Power/Energy Sensors

In order to find a compatible power/energy sensor for your application, click on "here".

Beam Propagation - M²

M Squared option enables user to choose equipment capable beam propagation analysis, including Beam Watch or BeamSquared and wide selection of lens to optimize measurement and provide accurate results.

Beam Profiler Finder Input Screen

Step 1 Measurement Type Beam Profile M Squared - Beam Propagation

Step 2 Laser Beam Criteria

Laser

CW

Pulsed

Beam Parallel?

Yes or divergence < 1°

Converging

Step 3 Enter Laser Parameters

Beam Diameter at beam Waist (mm) *

Wavelength * nm

Power Range - Min to Max * to mW

M²

Divergence Half angle mrad

Distance from Beam Waist to focusing Lens (mm) *

Step 4

Max. Power Density at Input W/cm2

30.58

Max. Energy Density J/cm2

0.00e+0

M Squared

1.20