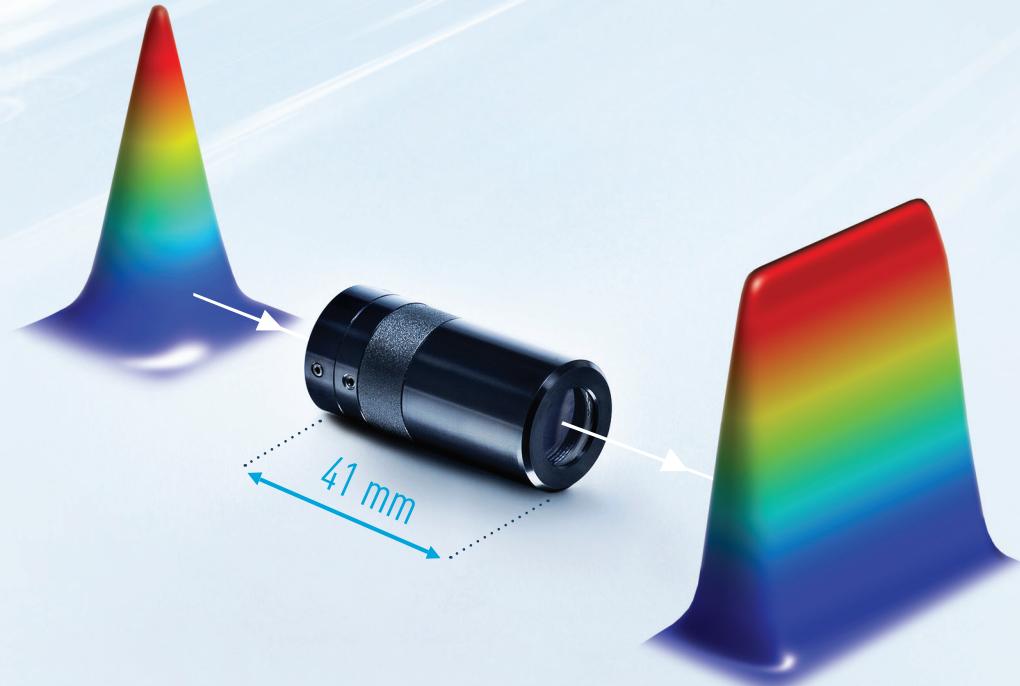




STRUCTURED LIGHT AND  
LASER BEAM SHAPING SOLUTIONS

## TOP HAT BEAM SHAPER

Converts a gaussian laser beam to a top hat profile with high uniformity, high efficiency with no high frequency noise in a flexible compact module.



### FEATURES

- Achromatic
- High efficiency, all glass optics
- Smooth slow variations with no high frequency noise
- High edge steepness
- Flat top size from 50um to several mm
- Flexible aspect ratio from gaussian to flat top axis

### APPLICATIONS

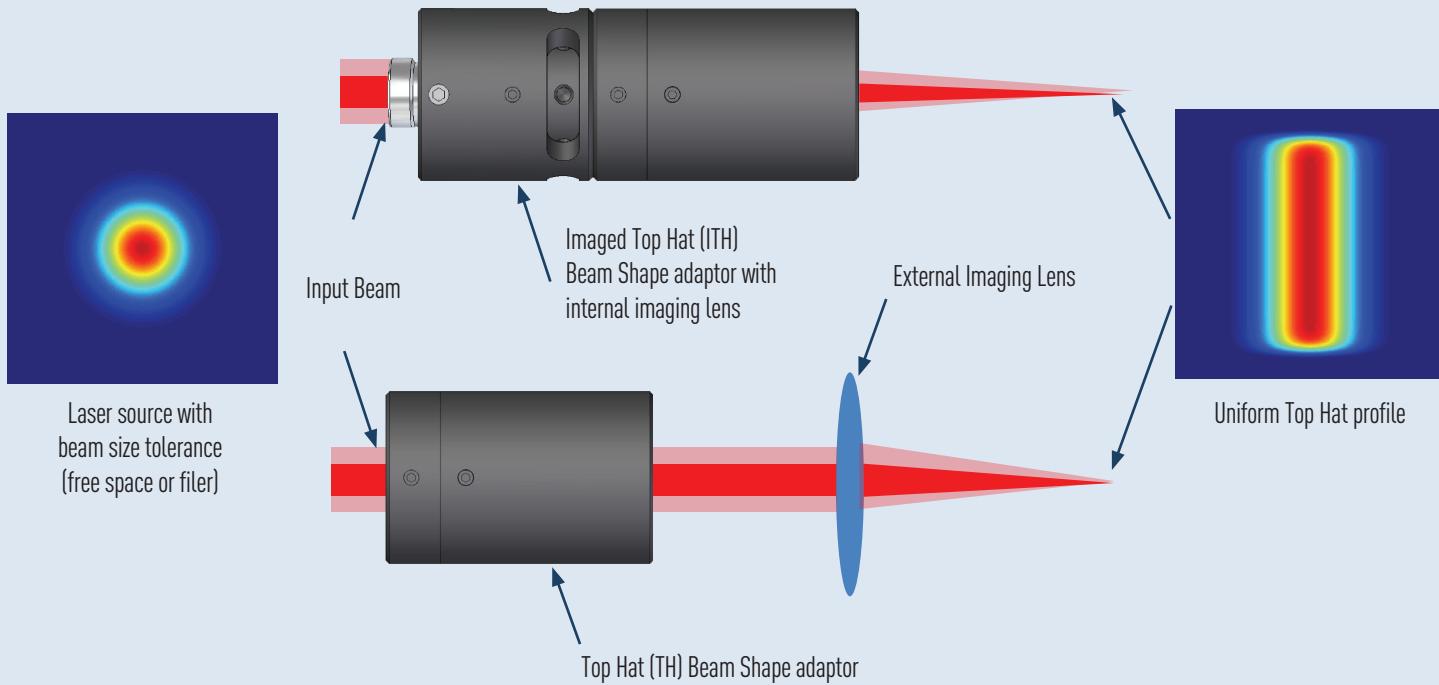
- Flow cytometry
- DNA sequencing
- Micromachining
- Confocal microscopy

Osela's Top Hat Module efficiently transforms a freespace laser beam or laser beam from a fiber into a uniform slow varying profile with no high frequency noise. The Top hat module is based on all glass optics providing a Top Hat profile at the focal plane of an imaging system.

The Top Hat dimension at the image plane is directly proportional to the the effective focal length,  $f$ , of your imaging system:

$$\text{Top Hat Dimension} = K * F$$

Where  $F$  is the focal length and  $K$  is a constant for specific Top Hat model. It can be offered with an internal imaging lens (model ITH) or without (model TH) to be used with an external imaging lens system (i.e. microscope objective).

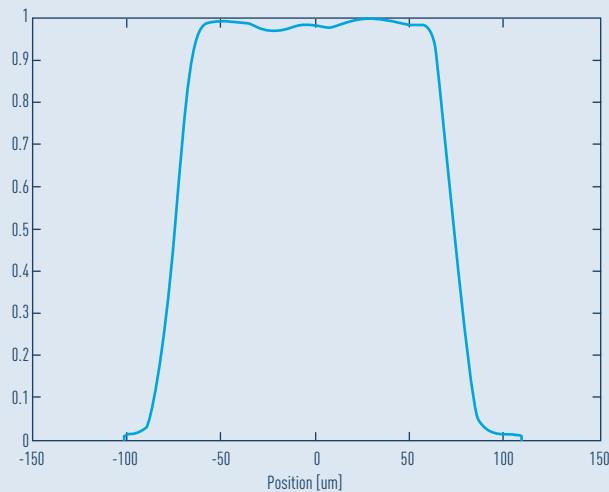


## SPECIFICATIONS

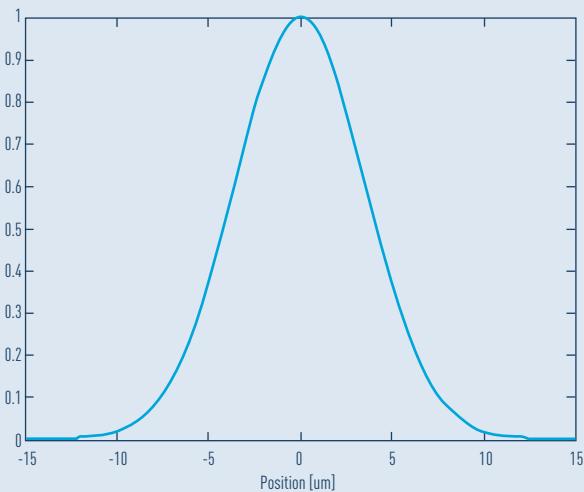
| ITEM                      | SPECIFICATION                               | CONDITION                         |
|---------------------------|---|-----------------------------------|
| Input beam size           | 0.5 to 4.0mm                                | At 1/e2                           |
| Operating wavelength      | 250 to 1300nm                               | AR coating needs to be considered |
| Top Hat size constant (K) | 0.001 to 0.6                                |                                   |
| Cv Uniformity             | <2% for fiber version<br><3% for free space | TEM00 beam                        |
| Contained energy          | >70%  | Over the region of interest       |
| Efficiency                | >95%  | >97% of diverging TH              |
| Glass material            | Fused silica                                | Other material upon demand        |
| Imaging lens              | 14, 20 30, 40 60, 75, 80 or 100mm           | Other focal lengths upon demand   |

# TOP HAT PROFILES

## TOP HAT AXIS PROFILE, CV UNIFORMITY <1%



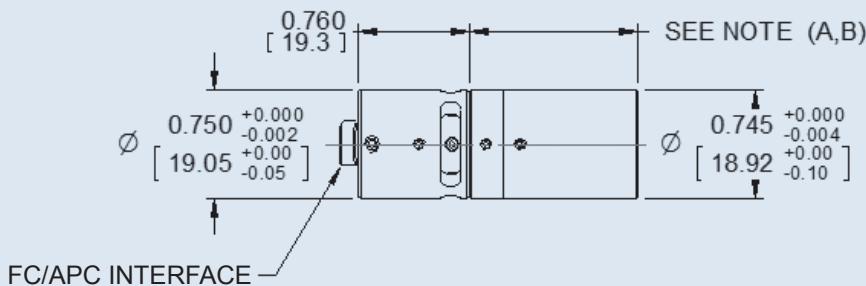
## GAUSSIAN AXIS PROFILE



Real profiles from a 405 nm, 100 mw free spaced laser focused at 40mm

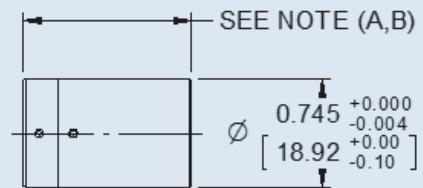
## MECHANICAL SPECIFICATIONS

### Fiber Option



NOTE: (A) ADD  $1.155 \pm 0.010$  [29.34 ± 0.25] FOR DIVERGING TOP HAT  
 (B) ADD  $1.625 \pm 0.010$  [41.28 ± 0.25] FOR FOCUSED TOP HAT

### Free Space Option



DIMENSION ARE IN : inch [mm]

## ORDERING CODE

| Model | - | Wavelength | - | Input beam size | - | Constant | - | Image lens | - | Option         |
|-------|---|------------|---|-----------------|---|----------|---|------------|---|----------------|
| ITH   | - | 250        | - | 0.5             | - | 0.001    | - | 14, 20, 30 | - | FS: Free space |
| TH    | - | to         | - | to              | - | to       | - | 40, 60, 70 | - | FC/APC:        |
|       | - | 1300nm     | - | 4.0mm           | - | 0.6      | - | 80, 100    | - | Fiber input    |