

## 3.5.2 Beam Splitter + Neutral Density Filters Combo

The attenuators described before can provide a high degree of attenuation however, these neutral density attenuators cannot dissipate more than 5W or so. Therefore we often place beam splitters in front of the attenuators to reduce the intensity before the ND filters.

These beam splitters are made of UV grade fused silica for use from 190 to 2500nm. Since they do not absorb light, they have a much higher power handling capacity than the ND attenuator/filters.

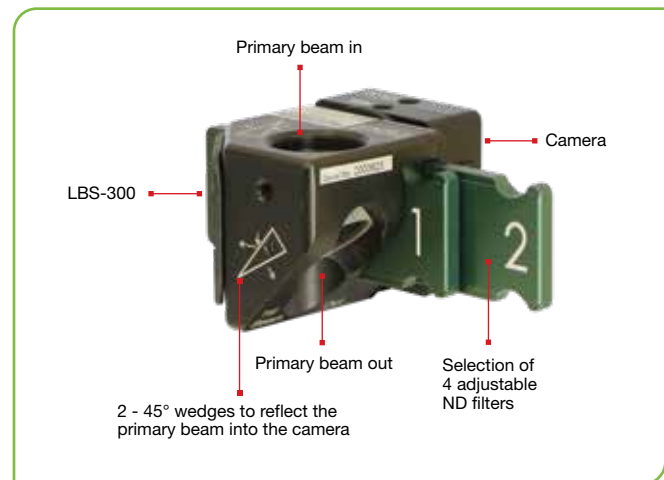


Model	LBS-300s	LBS-300HP-NIR	LBS-400	LBS-100
Wavelengths	multiple versions from 190-2500nm	980-1100nm	UV or 10.6µm	multiple versions; 400-700nm, 1064nm, 10.6µm
Reflection	0.01% of incident beam For reflectance Spectra see LBS-300 User Note	<0.0001%	0.01%	4% @ 400-900nm, 1% @1064nm, 0.5% or 5% @10.6µm
Nominal ND value	See spec sheet	0.4, 0.8, 1, 2, 3, 4	0.5, 1.0 in both filters	0.3, 0.7, 1, 2, 3, 4 for 300-700nm & 1064nm 30% & 60% for 10.6µm
Clear Aperture	Ø17.5mm	Ø15mm	Ø31.75mm	Ø19mm
Damage threshold	See spec sheet	See spec sheet	See spec sheet	See spec sheet
Mounting	C-Mount	C-Mount	Custom thread	C-Mount and Lab post mounted

### LBS-300s Beam Splitters

The LBS-300s beam splitter attachment for C-mount, CS-mount, or Ophir mount cameras allow you to measure laser beams with diameters up to 15mm and powers ranging from 10mW to ~400W<sup>(1)</sup>. The beam sampler is designed so that the preferential polarization selection effect of a single wedge is cancelled out and the resulting beam image is polarization corrected to restore the polarization components of the original beam. The beam sampler operates by reflecting the incoming beam from the front surfaces of a pair of wedges through 90 degrees into the camera. Approximately 99% of the beam is transmitted through the beam sampler with 0.01% passed on to the camera. A set of adjustable ND filters are provided to make final intensity adjustments to the beam before it reaches the camera imager. If additional attenuation is needed, an external wedge may be mounted at the input port, however this 3rd wedge will cause polarization selectivity when the beam is significantly polarized different in the S and P planes. A 1.035-40 thread is provided behind each wedge along the axis of the output beam that can be used to directly mount accessories with 1" lens tubes such as beam dumps or even power and energy sensors to the LBS-300s.

(1) For Gaussian beam diameter <1/2 the clear aperture and depending on ND filter and camera saturation limits the maximum power may be as high as 1000W.



## Specifications

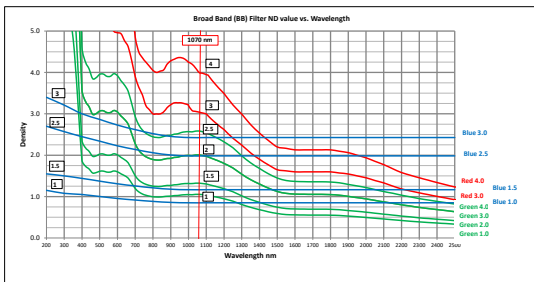
Model	LBS-300s-UV	LBS-300s-VIS	LBS-300s-NIR	LBS-300s-BB
Wavelengths	266-355nm	400-950nm	950-1800nm	190-2500nm
Wedge Material	UVFS	UVFS	UVFS	UVFS
Wedge Coating	A/R ≤1%	AR ≤1%	AR ≤1%	No coating, 4% reflection
Clear aperture	17.5mm	17.5mm	17.5mm	17.5mm
Reflection <sup>(1)</sup>	0.01%	0.01%	0.01% <sup>(2)</sup>	0.16%
Wedge ND value, each	ND ≥2	ND ≥2	ND ≥2	ND ~1.3
Maximum allowable input to wedge	1MW/cm <sup>2</sup> 5 J/cm <sup>2</sup>	1MW/cm <sup>2</sup> 5 J/cm <sup>2</sup>	1MW/cm <sup>2</sup> 5 J/cm <sup>2</sup>	10MW/cm <sup>2</sup> 20 J/cm <sup>2</sup>
ND Filters	Inconel	Bulk ND	Bulk ND	Combination of Inconel and Bulk ND
ND Values, nominal	0.3, 0.7, 1.0, 1.5, 2.0, 3.0 (Blue holders)	0.3, 0.7, 1.0, 2.0, 3.0, 4.0 (Green holders)	0.4, 0.8, 1.0, 2.0, 3.0, 4.0 (Red holders)	See Broad Band (BB) chart below
Filter Slides	3	3	3	5
Maximum allowable input to filter <sup>(3)</sup>	100 W/cm <sup>2</sup> CW 20mJ/cm <sup>2</sup> , 10ns pulse	50 W/cm <sup>2</sup> 1J/cm <sup>2</sup> , 10ns pulse	50 W/cm <sup>2</sup> 1J/cm <sup>2</sup> , 10ns pulse	See UV, VIS and NIR specifications
Part number	SP90464	SP90465	SP90466	SP90467

### Accessories

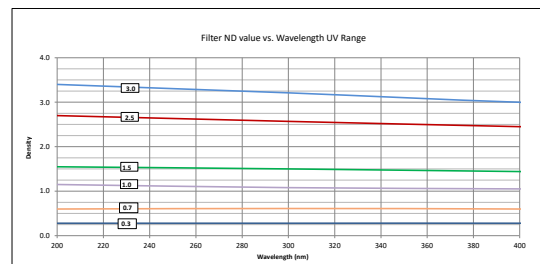
Large C-mount Wedge Splitter	For additional attenuation add this to the front end of the LBS-300. Good for 350-2000nm	SP90273
Beam Deflector Assembly	for 350-1200 nm only	SP90263
Beam Deflector Assembly	For 266 nm, high damage threshold	SP90287
Beam Deflector Assembly	For 355 nm, high damage threshold	SP90286
Beam Deflector Assembly	For 532 nm, high damage threshold	SP90285
Beam Deflector Assembly	For 1064 nm, high damage threshold	SP90284
2" LT- Mount Extension Tube	2" Extension tube between LBS-300s and camera, reduces noise on the camera, reduces intensity on ND, other uses	SP90575
3" LT- Mount Extension Tube	3" Extension tube between LBS-300s and camera, reduces noise on the camera, reduces intensity on ND, other uses	SP90574
LT To External C-Mount Adapter	Adapter to fit tube to LBS-300s - required with 2" and 3" extension tubes	SP90576
LT To Internal C-Mount Adapter	Adapter to fit tube to camera mount - required with 2" and 3" extension tubes	SP90577

Notes: (1) For reflectance Spectra see LBS-300 User Note.  
 (2) For 1000nm reflectance is ~0.04% and for 950nm reflectance is ~0.16%.  
 (3) This is the damage threshold of the filter glass of the filters. Distortion of the beam may occur with average power densities of 5W/cm<sup>2</sup> for beam size 5mm, 10W/cm<sup>2</sup> for 2mm beam and >30W/cm<sup>2</sup> for 1mm beam

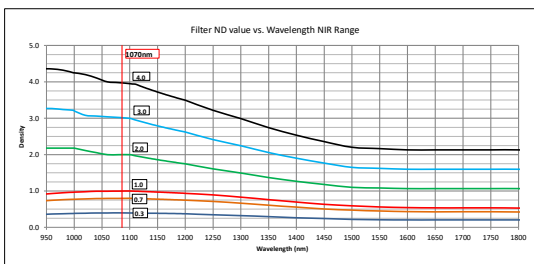
Optional SP90273 Large C-mount Wedge Splitter



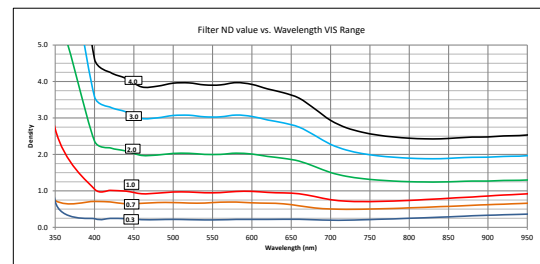
VIS and NIR ND glass filter set (Green and Red Holders) & UV metallic coating filter set (Blue) - SP90467



UV filter set (Blue Holders) – SP90464



NIR filter set (Red Holders) – SP90466



VIS filter set (Green Holder) – SP90465