

# ASE Suppression Filters and Beamsplitters



Free Space or Fiber Pigtailed

Ondax's NoiseBlock™ ASE (Amplified Spontaneous Emission) filters suppress the broad spectrum of spontaneous emission from laser diodes to provide a pure, ASE-free, single frequency laser.

The ASE Filter is a reflective Volume Holographic Grating (VHG) with typical bandwidth of less than 150 pm and throughput greater than 90%. The VHG is purposely manufactured with a slant that provides an angular separation between the specular reflections from the surface of the VHG and the filtered laser beam.

NoiseBlock™ filters also make excellent 90/10 beamsplitters, by reflecting 90% of incoming single frequency light at a specified angle and transmitting the remaining 10%.

## Features:

- High transmittance at design wavelength
- Greater than 40dB reduction in broad ASE spectral background
- Narrow spectral bandwidth
- Customizable slant angle for angular separation of beams
- Fiber coupled input/output available
- Environmentally stable at high temperature and humidity with over 12,000 hours of testing at 150°C
- No degradation under high power illumination conditions:
  - > several kW/cm<sup>2</sup> average power
  - > 170MW/cm<sup>2</sup> peak power (fluence of 3.8 J/cm<sup>2</sup>) at 1064nm

## Specifications:

Parameter	Minimum	Typical	Maximum	Unit
Center Wavelength	375	488, 514.5, 532, 633, 785, 987	2700	nm
Bandwidth (FWHM) <sup>1</sup>	0.03	<0.15		nm
Diffraction Efficiency		>90		%
Temperature Dependence		0.01		nm/°C
Deflection Angle		4 - 5		Degrees
Grating Slant Angle		2		Degrees
Standard Dimensions (X, Y)	0.5		25	mm
Thickness	0.3	0.6 - 3	30	mm

<sup>1</sup> Grating bandwidth is a function of wavelength and thickness

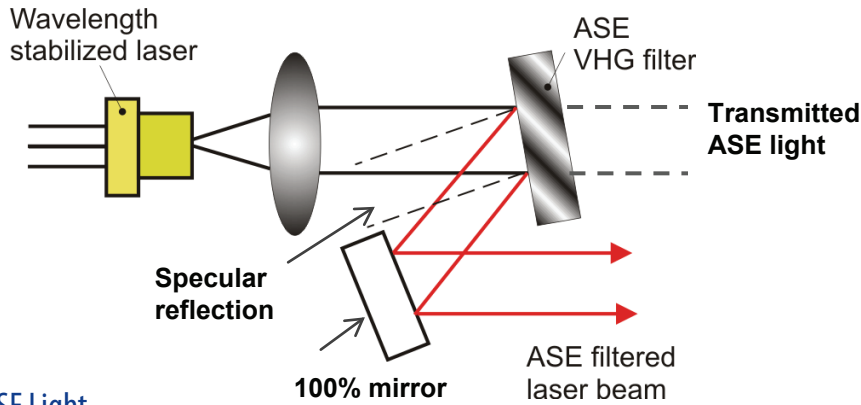
## Applications:

- Spectral Linewidth Reduction of Multimode and Single Frequency Lasers
- ASE Noise Reduction in Raman Spectroscopy
- 90/10 Beamsplitter

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## Principle of Operation

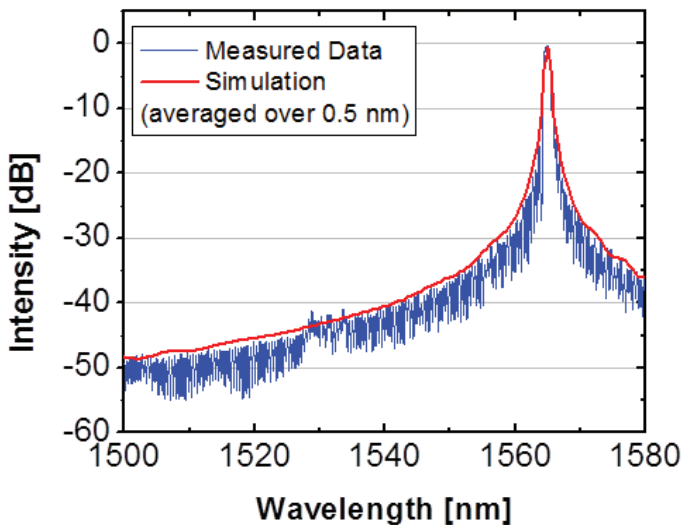
NoiseBlock™ filters are designed to transmit the ASE component of the emission from a wavelength stabilized laser and reflect the desired single frequency line. The grating slant angle is chosen to create separation between the diffracted light and the specular reflection from the surface of the VHG.



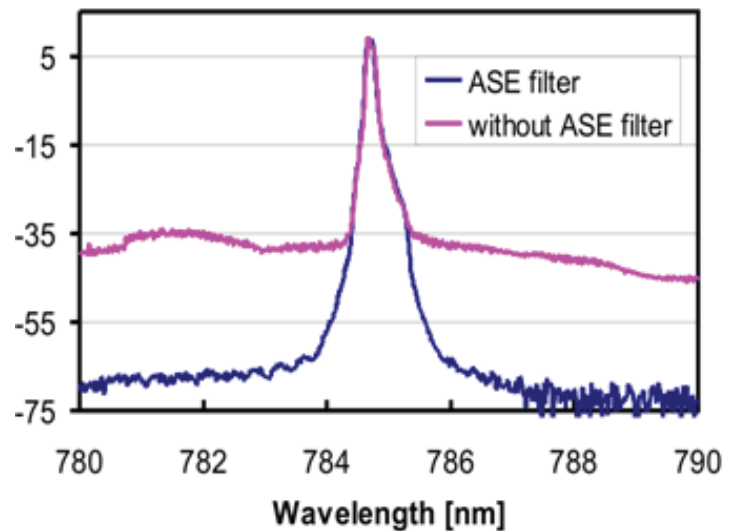
## High Suppression of ASE Light

Measured output from a 1565nm NoiseBlock™ ASE filter (left) shows excellent agreement with the simulated prediction. Adding a NoiseBlock™ filter to a single frequency wavelength stabilized laser at 785nm (right) shows more than 90% of the single frequency line is conserved while removing approximately 40dB of the broad ASE spectral background. Measured results are limited by the detector dynamic range.

Measured NoiseBlock™ Filter Performance



Reduction of ASE light with NoiseBlock™ filter



Ondax's PowerLocker® wavelength stabilization gratings are produced in a proprietary glass designed for long lifetime, high efficiency and low loss. Ondax's fabrication process is highly stabilized to ensure excellent part-to-part repeatability.



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For more information about Ondax products and the name of a local representative or distributor, visit [www.ondax.com](http://www.ondax.com), email [sales@ondax.com](mailto:sales@ondax.com), or call (626) 357-9600. Specifications subject to change without notice.