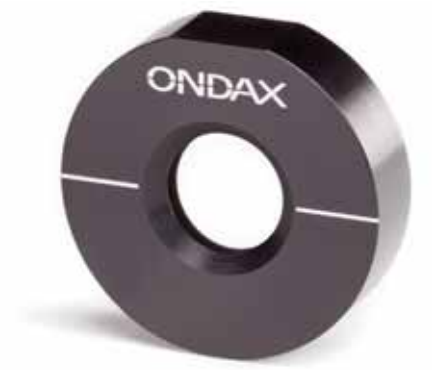
NoiseBlock™

90/10 Beamsplitter Filters



Ondax's NoiseBlock™ 90/10 beamsplitter filters are designed to diffract 90% of the incoming light that matches the designed Bragg wavelength (λ_0) and incident angle. All other wavelengths will be transmitted through the filter, making them excellent for boosting the effective signal of a Raman spectrometer.

Adding a NoiseBlock™ 90/10 beamsplitter filter to a Raman spectrometer with a wavelength stabilized laser source can increase the recovered Raman signal by almost a factor of 4 relative to a broadband 50/50 beamsplitter.

The filter's narrow spectral profile (HWHM <10cm^{-1}) is designed to match the SureBlock™ ultra-narrow-band notch filter, making it ideal for enabling ultra-low frequency Raman spectroscopy with high signal-to-noise.

Features:

- High transmittance at design wavelength
- Narrow spectral bandwidth
- Customizable slant angle for angular separation of beams
- No degradation under high power illumination conditions

Applications:

- 90/10 beamsplitter
- Removal of broadband ASE, fluorescence, and unwanted laser line emission

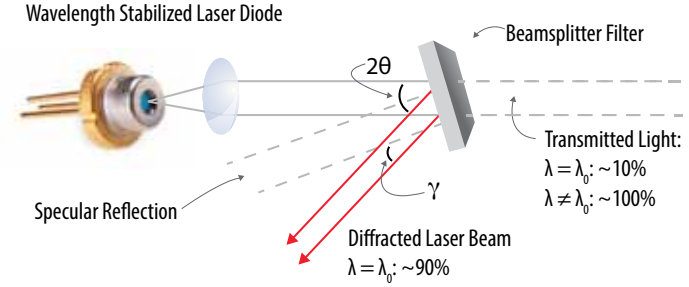
Specifications:

Parameter	Minimum	Typical	Unit
Center Wavelength	405	488, 514, 532, 633, 640, 658, 685, 690, 780.25, 785, 808, 830, 976, 1064, 1550	nm
Bandwidth[1]	0.03	<0.15 <10	nm (FWHM) cm^{-1} (HWHM)
Diffraction Efficiency		90	%
Temperature Dependence		0.01	nm/ °C
Total Deflection Angle (2θ)		8 - 12	Degrees
Inter-beam Angle (γ)		2	Degrees
Clear Aperture Diameter	9mm in 1" mount. Custom sizes available		

[1] *Grating bandwidth is a function of wavlength and thickness*

Principle of Operation

NoiseBlock™ 90/10 beamsplitter filters are designed to reflect only the desired single frequency line (λ_0) from a wavelength stabilized laser. The inter-beam angle is chosen to separate the diffracted beam and the residual surface reflections.



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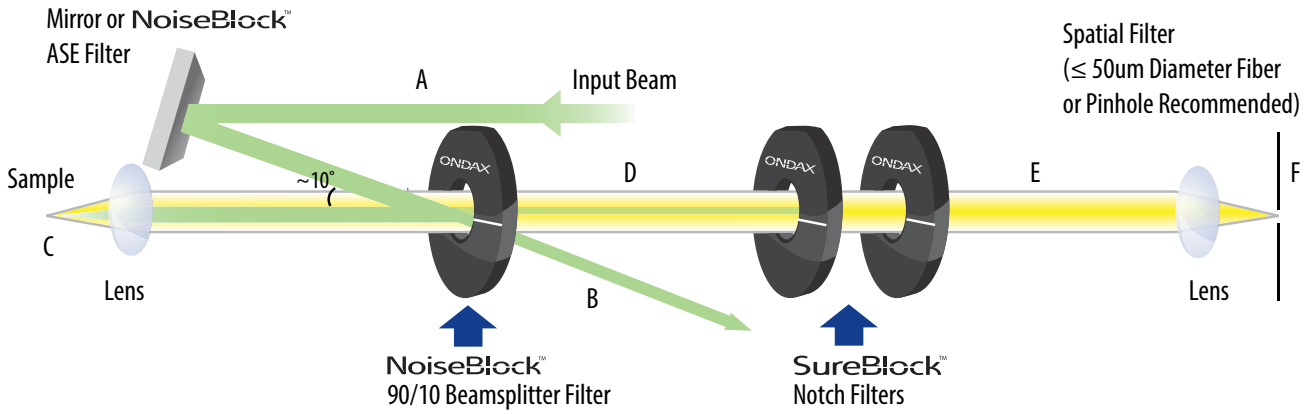
Principle of Operation



A high throughput low frequency Raman spectroscopy system can be assembled by combining a NoiseBlock 90/10 beamsplitter with two SureBlock notch filters and optional NoiseBlock ASE suppression filters. The resultant system is capable of measuring Raman signals as low as $<10cm^{-1}$ from the laser line.

90% of the input power matching the design wavelength (A) is diffracted by the beamsplitter toward the sample with all other wavelengths transmitted through the beamsplitter. After excitation of the sample, the beamsplitter diffracts 90% of the Rayleigh scatter toward the laser but transmits the entire Raman signal. The result is a ~4X signal boost compared to a broadband 50/50 beamsplitter that creates only half the Rayleigh and Raman scatter then splits half the Raman signal away from the spectrometer path.

	Broaband 50/50 Beamsplitter	NoiseBlock™ 90/10 Beamsplitter
Power at sample (C)	50%	90%
Raman signal after beamsplitter (D)	50%*50%=25%	90%*100%=90%
Rayleigh signal after beamsplitter (D)	50%*50%=25%	90%*10%=9%

Ordering Information

BS-λλλ.λ - AA

λ: Wavelength[1] (nm)

A: Package Style[2]

[1] Specified in vacuum to 0.1nm accuracy required for non-gas lines

[2] FS = Standard 1" round mount, XX = Unmounted

Ondax 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.

ONDAX

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