Flexible Wavelength Selector (FWS):

A Versatile Alternative to Line Bandpass Filters with Superior Out-of-Band Blocking for Traditional Laser, LED and Lamp Light Sources

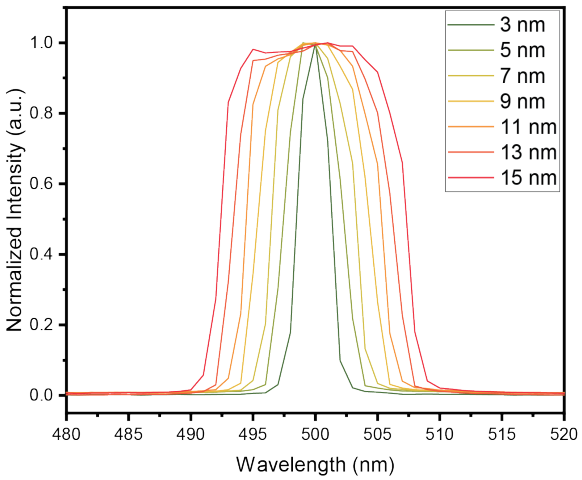
Introduction:

A line bandpass filter allow a specific range, or band, of wavelengths to pass through while blocking others. The main purposes and applications of using line bandpass filters is Spectral Filtering. It can be used in various optical systems to isolate a narrow spectral line, such as a specific laser line or fluorescence signal, from a broader spectrum of light. This is crucial in applications like spectroscopy, where precise wavelength selection is necessary. In addition to this, the line bandpass filter can reduce noise by filtering out unwanted wavelengths. In imaging systems, particularly used in fluorescence microscopy or remote sensing, these filters can enhance image contrast by isolating the specific wavelength of interest from ambient or background light. By selecting only the desired wavelengths, line bandpass filters are essential for improving performance and accuracy in many optical and photonic applications.

SpectroLight's advanced Flexible Wavelength Selector (FWS) series offers a revolutionary solution of line bandpass filters for versatile purpose. This application note demonstrates how our FWS products can effectively replace conventional filters while providing superior performance and flexibility across a wide range of optical applications.

Light Done Right!

Key feature : Adjustable bandwidth



Key Features:

- Extended wavelength range: 255-1700 nm
- Adjustable bandwidth: 2-15 nm (nominal)
- High transmission efficiency
- Superior out-of-band rejection: OD 10
- High damage threshold
- No beam deviation or walk-off during tuning

Versatility:

The FWS series can be applied as an alternative to Line bandpass filter for various light sources such as Laser, LED and Lamp Light Sources.
Replacing Both Laser Line Filters and Lamp Filters The FWS series stands out for its ability to replace multiple traditional optical filters:

1. As a Laser line bandpass filter Alternative:

- Precise selection of specific laser wavelengths
- Adjustable bandwidth for optimized performance
- Rapid switching between different laser wavelengths

2. As a LED or Lamp line bandpass filter alternative:

- Selective extraction of specific wavelengths from broadband spectrum
- Adjustable bandwidth to accommodate various experimental requirements
- Real-time wavelength and bandwidth tuning for dynamic experiments

Highlight:

Unparalleled Out-of-Band Blocking With an Optical Density (OD) of 10, our FWS products offer superior out-of-band blocking compared to many traditional filters, ensuring:

- Extremely high signal-to-noise ratio
- Minimal light contamination from unwanted wavelengths
- Enhanced precision in spectroscopic and imaging applications

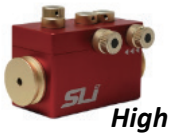
Recommended Product Range:

1. CWS (Custom Wavelength Selector):
- Pre-configured for specific wavelengths
- Fixed bandwidth for consistent performance
- Ideal for known wavelength requirements

2. Manual:
- Cost-effective solution
- Manually adjustable wavelength and bandwidth
- Suitable for educational settings or budget-conscious labs

CWS (Custom Wavelength Selector)

Basic

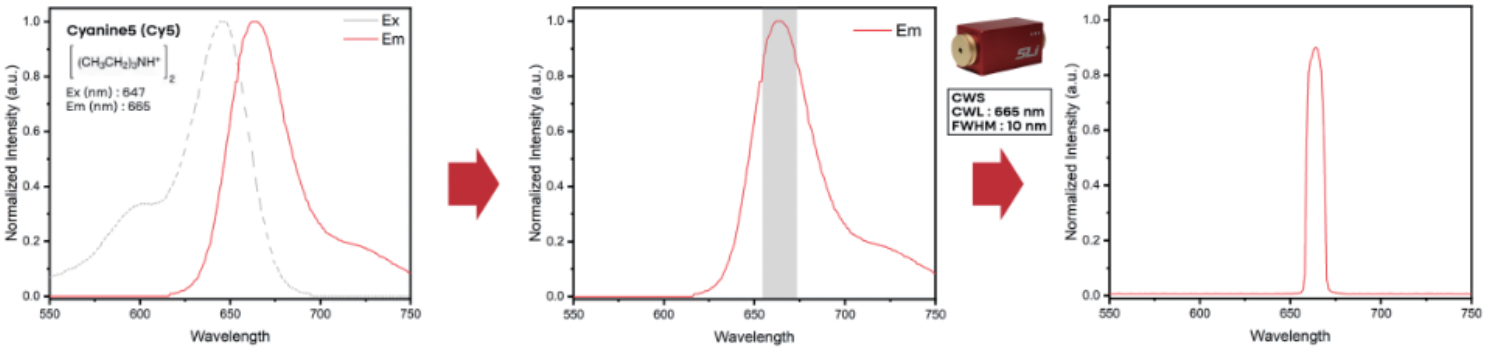


High resolution

Application example: Precise Fluorescence Emission Measurement with CWS

The CWS (Custom Wavelength Selector) excels in fluorescence spectroscopy, surpassing traditional broadband detection methods for both LED and laser excitation sources. Pre-configured for specific wavelengths, it precisely isolates emission peaks from fluorescent samples. The CWS enhances signal-to-noise ratios, detects weak signals, and provides superior out-of-band blocking. This makes it ideal for high-sensitivity fluorescence studies across various experimental setups, ensuring consistent performance in isolating desired emission wavelengths.

Fluorescence detection of CY5 dye at ***CWL : 665 nm, FWHM : 10 nm***



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Potential Users: Key Beneficiaries of CWS and Manual Series

1. Researchers requiring flexible spectral control:
- Scientists needing both fixed wavelengths and adjustable bandwidths
- Users who benefit from the ability to fine-tune spectral output for various experiments
- Professionals working across different applications requiring adaptable spectral filtering

2. Budget-conscious labs seeking high performance:
- Academic institutions and small research groups
- Users who need superior out-of-band rejection (OD10) at a competitive price point
- Those looking to replace multiple fixed filters with a single, versatile device

3. Spectroscopists and laser researchers:
- Scientists working with specific emission or absorption lines
- Users needing to clean up laser lines or select wavelengths from multi-line lasers
- Researchers who value the ability to adjust bandwidth for optimizing signal-to-noise ratios

Conclusion:

SpectroLight's Flexible Wavelength Selectors represent a significant advancement in optical filtering technology, effectively replacing traditional line bandpass filters for Laser, LED and Lamp Light Sources with a single, versatile device. With exceptional OD 10 out-of-band blocking and unprecedented flexibility in wavelength selection, these products enable researchers to conduct a wider range of experiments with improved precision and efficiency. Whether used for laser applications, broadband light sources, or specialized research, the FWS series provides a superior alternative to conventional filtering methods, making it an indispensable tool for modern optical research and applications.