ProCareLight
Light, Laser and Safety Solutions

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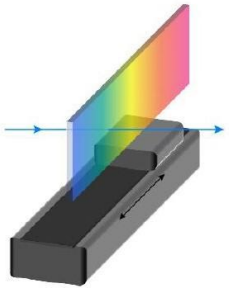
Comparison for tunable filters

Flexible Wavelength Selector (FWS) Comparison

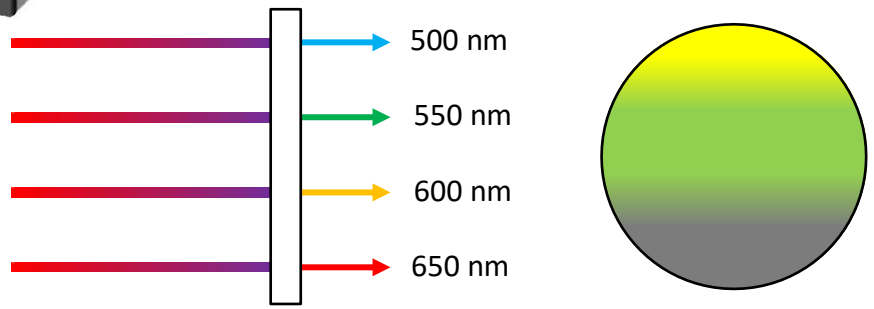
	Liquid Crystal	Acousto-Optic Tunable Filter(AOTF)	Grating	Laser Line Tunable Filter (LLTF)		Flexible Wavelength Selector (FWS)	
Laser Damage Threshold	low	high	high	high		high	**< 2 MW/㎠ (CW)**
Passband shape	poor	poor	poor	great		great	**Maintaining the input beam characteristics**
Out-of-band blocking	poor	poor	poor	good	OD 6	**great**	**OD 10 up to 1700 nm**
Wide tuning range	high	discontinuous	high	high		high	**255-1700 nm**
Adjustable bandwidth in real-time	x	x	x	x		**possible**	**2-15 nm (nominal)**
High Throughput	poor	poor	poor	good	~ 65%	**great**	**≥ 75 %**
Aperture size	Limited	Limited	Limited	Limited	< 5 mm	**Diverse (5, 10 mm)**	**Work with both Laser and lamp types**
Polarization	Dependent	Dependent	Dependent	Independent		Independent	**Unpolarized**
Distortion	Free	O	O	Free		Free	**No distortion**
Custom set wavelength	Fixed range	Fixed range	Fixed range	Fixed range		Free	**Select any wavelength from 255 – 1700nm**

LVBF and Flexible Wavelength Selector (FWS) Comparison

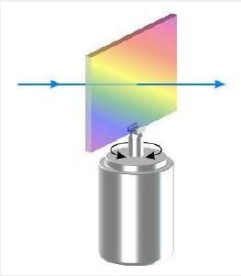


LVBF : Linear variable bandpass filter

☞ **When light enters a specific location, only certain wavelength pass through the filter.**

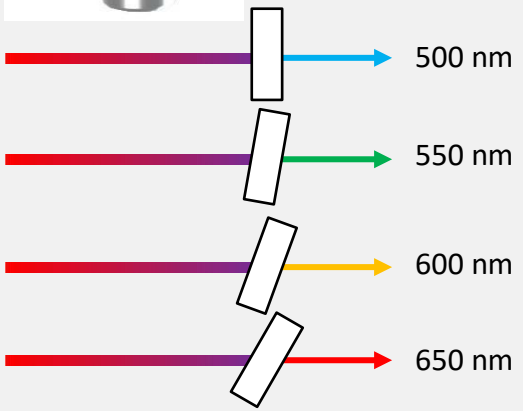


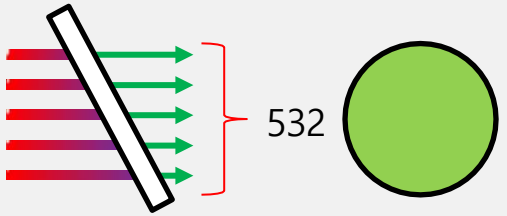
Differences in precision occur depending on beam size



ADTF : Angle dependent tunable filter (FWS)

☞ **When light enters with a specific angle, only certain wavelength pass through the filter.**





Uniform wavelength distribution

Advantages	*Disadvantages*
- High transmission	- Poor edge steepness
- High damage threshold	- Slow tuning speed
- Polarization insensitive	- Limited tuning Range
	- Limit of precision

Advantages
- High transmission
- Wide tuning Range
- High edge steepness : narrow FHWM
- High out of band blocking

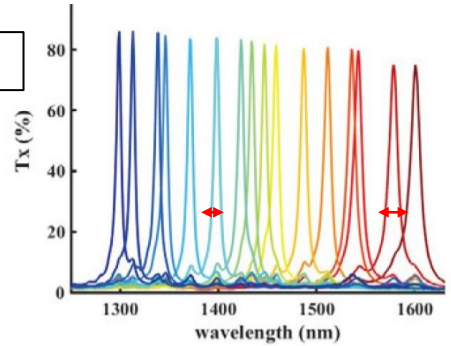
Flexible Wavelength Selector (FWS) Strength

"The ONLY tunable bandpass filter that adjusts bandwidth uniformly across all wavelengths."

Accurate and adjustable bandwidth

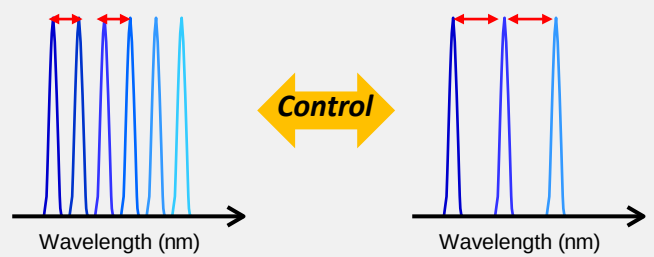
Others : Irregular Bandwidth

Irregular bandwidth

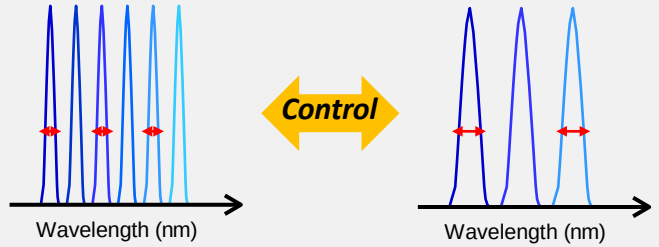


FWS : Regular CWL & Bandwidth control

Constant Center Wavelength



Constant Adjustable bandwidth

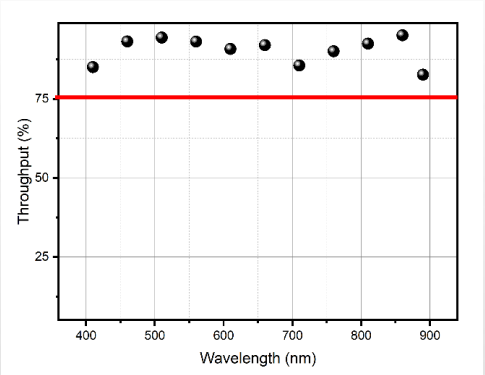


Flexible Wavelength Selector (FWS) Strength

Twinfilm™ technology surpasses the competition and exudes unparalleled sophistication.

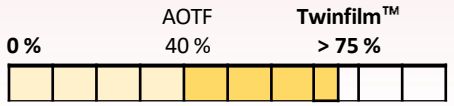
High transmission efficiency

More than 75% transmission efficiency at all wavelength

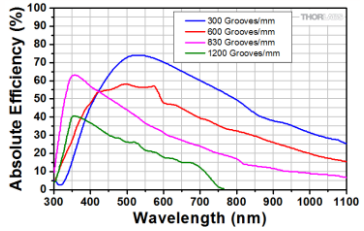


competitiveness **" Transmission efficiency (%) "**

competitive technology
- ✓ Uneven efficiency by wavelength
- ✓ Low efficiency

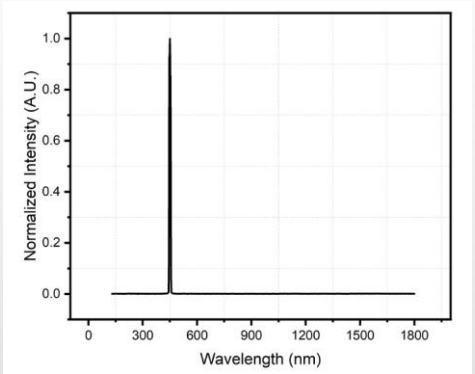


Grating



Select the desired wavelength

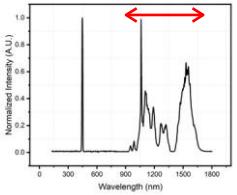
Extract only the input wavelength



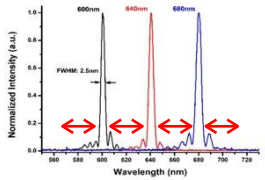
competitiveness **" Out of band suppression "**

competitive technology
- ✓ Unwanted wavelength detection
- ✓ Side lobes occur

Filter

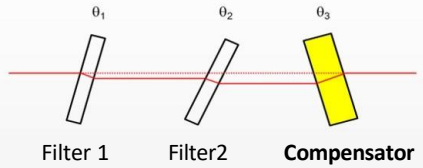


AOTF



No distortion

With no distortion, it can apply various imaging methods.

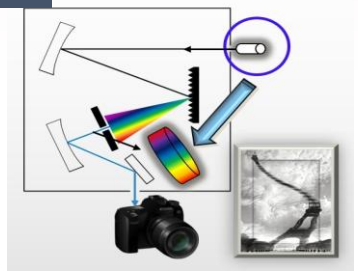


The compensator prevents the beam path from becoming distorted and maintains good pointing stability.

competitiveness **" Distortion free "**

competitive technology
- ✓ Distortion occurs by selecting the wavelength through a slit.

Monochromator



Flexible Wavelength Selector (FWS) Poly type

FWS-Poly-**Red**

More Precise

✓FWHM adjustable
2 – 15 nm (nominal)

Precise bandwidth control

Applications

- Sensor Calibration
- Hyperspectral Imaging
- Fluorescence Imaging

Common Specifications

1. **Broadband spectral range**
   255 – 1700 nm
2. **High damage threshold**
   < 2 MW/㎠(CW)
3. **High throughput**
   > 75 %
4. **Diverse aperture size**
   5 or 10 mm
5. **Great out of band blocking**

FWS-Poly-Red	*FWS-Poly-Blue*
OD 10 up to 1700 nm	*OD 5 in tuning range, OD 10 in spectral range up to 1700 nm*

6. **Does not affect beam shape**
   Distortion free

FWS-Poly-**Blue**

✓ FWHM fixed
10 or 20 nm (nominal)

Appropriate precision and improved output power

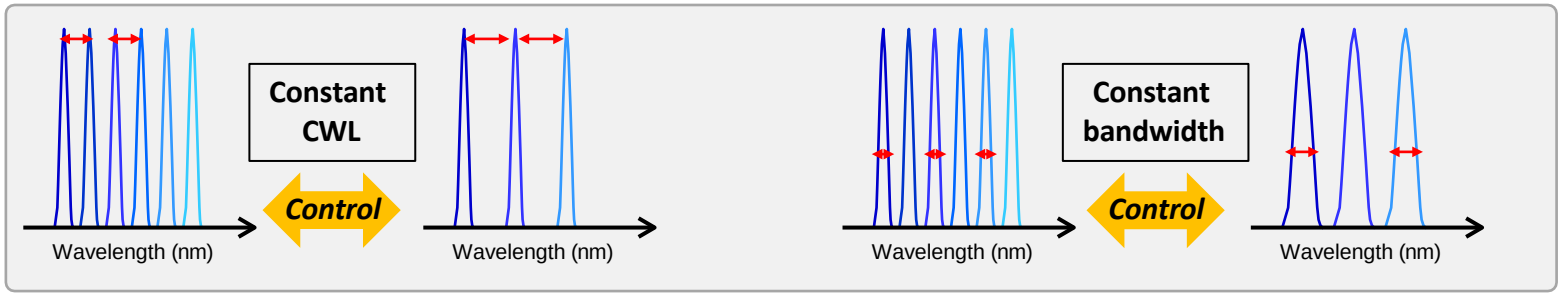
Applications

- Light source for Inspection
- Multispectral Imaging
- Fluorescence Imaging

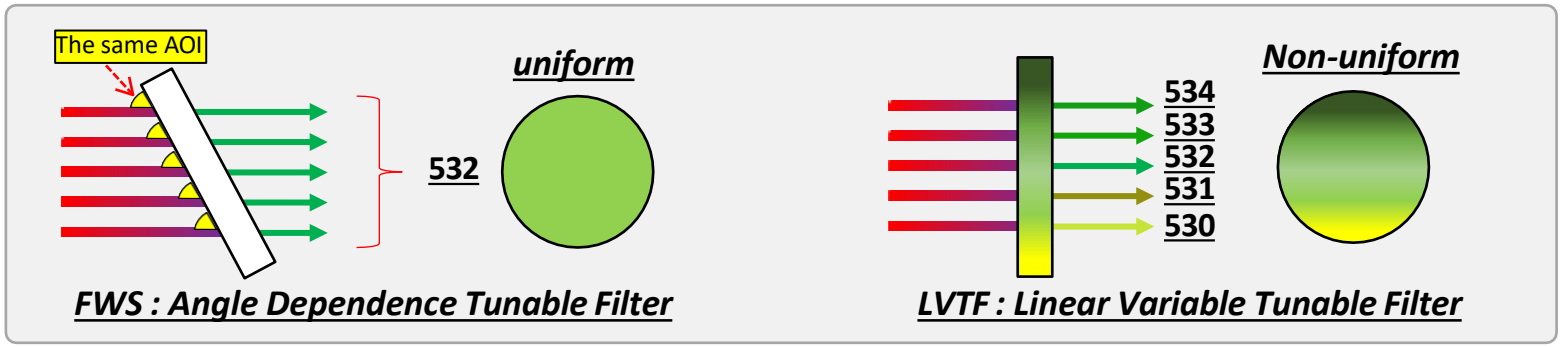
Strongpoint of Tunable Laser System (TLS) using FWS

1. Broadband tunablity up to SWIR (410 - 1700 nm) with one-box system

2. Accurate and adjustable bandwidth control using S/W : Regular CWL & Bandwidth



3. Uniform wavelength distribution inside the beam



4. Free customization of wavelength and output power range according to users needs

SLi

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