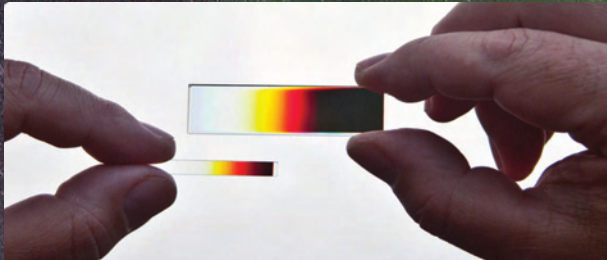


# UNRIVALED CONTINUOUSLY VARIABLE FILTERS

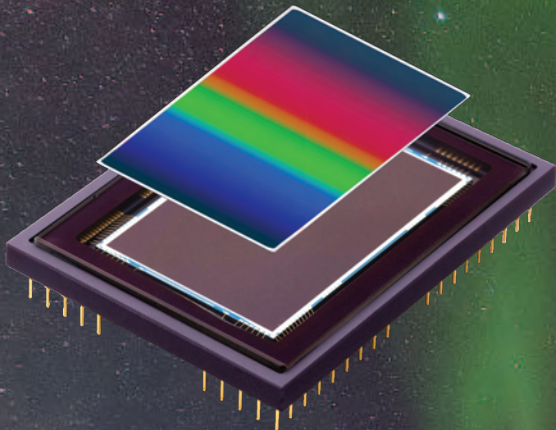
High-performance optical filters  
for discerning OEM customers

**WE ARE  
THE OPTICAL  
FILTER  
COMPANY.**

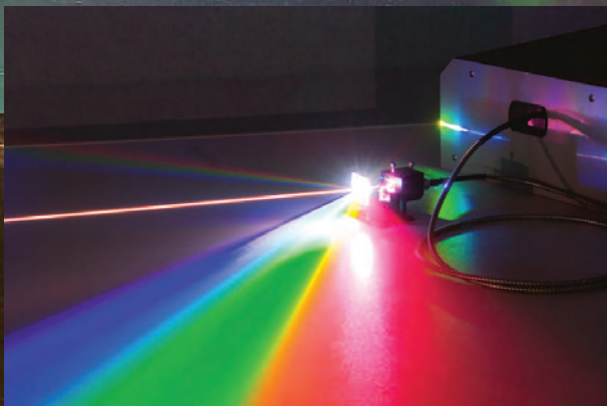




Continuously Variable Order Sorting Filter for suppression of higher orders and background noise in spectrometers (bottom) and standard size CVLWP (top).



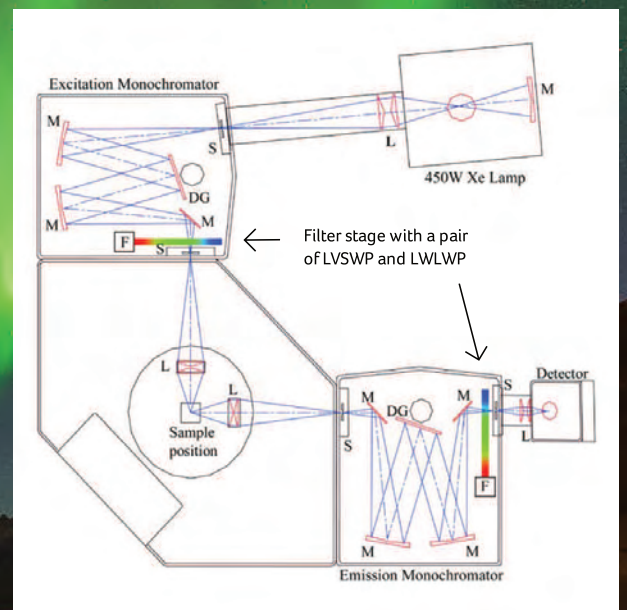
Continuously Variable Bandpass Filter mounted in front of imaging sensor for hyperspectral imaging applications.



A fully tunable bandpass filter formed by a pair of LVSWP and LVLWP is used in Supercontinuum Lasers as wavelength selector (By courtesy of Fianium Ltd).



Continuously Variable Order Sorting Filter mounted in front of sensor array for suppression of higher orders and background noise in compact spectrometers (By courtesy of Avantes).



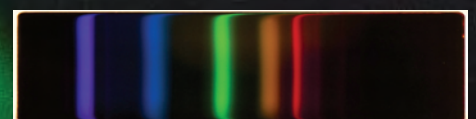
Grating based fluorescence spectrometer enhanced by LVFs (By courtesy of Edinburgh Instruments).



Continuously Variable Short Wave Pass Filter (CVSWP).



Continuously Variable Bandpass Filter (CVBP) illuminated by sunlight.



Lines of normal fluorescent lamp as seen directly through CVBP filter.



## DO YOU FACE THIS PROBLEM?

Do you often find that your standard edge filters are just a little bit off with the edge wavelength from what you require? Or that a conventional bandpass filter has the wrong center wavelength or bandwidth? Are you tired of stocking dozens of filters but still can't find the right filter? If so, a fully tuneable, high performance filter will solve your problem!

## HERE'S YOUR SOLUTION!

If you find yourself in one of the situations above then Delta Optical Thin Film's Continuously Variable Filters (CVF, a.k.a. Linear Variable Filters) are the solution to your dilemma. Delta Optical Thin Film's comprehensive family of CVFs gives you all the freedom you need.

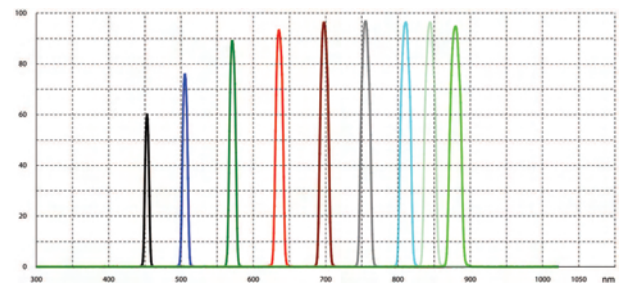
The filters cover the UVA-VIS-NIR wavelength range and comprise long wave pass, short wave pass and bandpass filters as well as dichroic beam splitters. They enable you to design your experiment or instrument as the application requires. Delta Optical Thin Film's Continuously Variable Filters do not limit your selection of filters to those in a catalog but provide an endless amount of customisation right at your fingertips by offering full flexibility and tuneability without compromise on performance.

## How does a Continuously Variable Filter work?

A Continuously Variable Filter is a filter whose spectral properties vary continuously along one dimension of the filter. A conventional fixed wavelength interference (or dielectric) filter consists of many dielectric layers with constant thickness across the entire filter substrate. A Delta Optical Thin Film CVF is manufactured in such a way that the thickness of the layers increases continuously from one end of the filter substrate to the other end.



Cross section (simplified) through a CVF along the gradient direction of the filter.



Some of the indefinitely many passbands along a Continuously Variable Bandpass Filter.

## Where to use Continuously Variable Filters?

Delta's new Continuously Variable Filters with higher transmission, steeper edges and deep blocking can now be used in many applications, including:

- Hyperspectral imaging cameras and instruments
- Wavelength selectors for Super Continuum Lasers
- Wavelength selectors for Xenon lamps
- Blocking of higher order contributions and suppression of background noise in grating-based instruments and mini spectrometers
- Purely filter-based spectrometers
- Purely filter-based fluorescence measurement systems
- Compact filter-based mini spectrometers

## Key features and user benefits

Unlike other variable filters, Delta's Continuously Variable Filters do not use thin metal layers or coloured glass. They are constructed from all-dielectric materials and manufactured with Delta's Ultra-Hard-Coating (UHC) technology. This provides some outstanding features for your benefit:

- Robust and durable surface coatings on unglued fused silica substrates
- Minimal auto-fluorescence
- High laser damage threshold
- Practically no spectral shift with temperature
- High transmission, no leaks in blocking range

## Challenge us with your requirements!

Delta has developed a complete family of Continuously Variable Filters for you to choose from. For technical details please refer to our homepage or the specific datasheets.

- Short Wavelength Pass Filters
- Long Wavelength Pass Filters
- Order Sorting Filters
- Dichroics optimised for 45° AOI
- UV Bandpass Filters
- VIS Bandpass Filters
- NIR Bandpass Filters

Should you not find what you need among our standard filters, our development team and network of sales offices and distributors are happy to work with you on a customised solution.

# ABOUT

## DELTA OPTICAL THIN FILM

Delta Optical Thin Film designs, manufactures, tests and supplies world class leading optical thin film filters and components. Our products are used in a variety of applications within the medical, bioscience, imaging, sensor, analytical and similar industries, and are designed and manufactured according to ISO 9001 and ISO 1400 standards.

High quality products are the keystone of Delta Optical Thin Film's success. Our quality management system ensures control and documentation of processes and products throughout the whole design and production process.

Located in Hørsholm, Denmark, Delta Optical Thin Film has since the 1960s been the pioneer in computer designed optical coatings.

In the early 1990s, Delta Optical Thin Film was among the first to implement computer controlled and automatic deposition of advanced optical coatings. Our development team is able to make extremely precise predictions of, for example, phase retardation, and uses other dedicated techniques, helping the world's leading manufacturers of analytical and biomedical instruments make unique instruments.

# WORKING

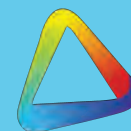
## WITH DELTA OPTICAL THIN FILM

Please visit [www.deltaopticalthinfilm.com](http://www.deltaopticalthinfilm.com) for our standard optical filter product range or contact us for an informal talk about your requirements.

Delta Optical Thin Film's high performance fluorescence filter sets represent the utmost in high transmission, steep edges and high broadband blocking.

Our products vary from custom designed solutions to a broad range of optical filters, filter sets, cubes, splitters and mirrors.

For the past six decades Delta Optical Thin Film has supplied world leading OEMs with first class optical filters, both for development purposes and in production volumes. Delta Optical Thin Film is more than just an optical filter supplier. Often we are involved in challenging the complete optical design, leading to a more robust and production-friendly total solution. If you don't know your optical filter specifications, explain your measurement challenge, and Delta Optical Thin Film will help your total solution to success.



**delta**  
optical thin film

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