



**MATERION**



**Linear Variable  
Interference Filters**

**BARR PRECISION OPTICS  
& THIN FILM COATINGS**



**Materion Barr Precision Optics & Thin Film Coatings** is a leading manufacturer and supplier of precision optical filters, hybrid circuits, flexible thin films and custom thin film coating services. We offer coating solutions for manufacturers in the defense, commercial, space, science, astronomy and thermal imaging markets.

## Linear Variable Interference Filters

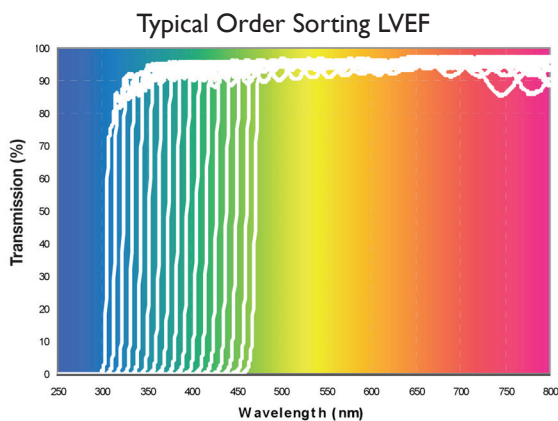
Materion designs and manufactures both edge-type and bandpass-type variable filters to customer specifications. The key feature of these devices is that spectral properties vary with position in a prescribed way along the lengthwise direction of the filter.

Materion has capabilities to manufacture variable filters within the spectral range from approximately 300nm in the ultraviolet to approximately 10 microns in the far infrared.

### Linear Variable Edge Filters

A Materion Linear Variable Edge Filter (LVEF) is comprised of an interference filter coating on a glass or fused silica substrate deposited in such a way that the spectral position of the edge varies linearly along the length of the filter.

LVEFs and LVBP filters are manufactured to customer spectral and dimensional specifications. These filters are made with durable oxide coatings on glass or fused silica substrates. Linear Variable Edge Filters are typically used in grating-based systems as order sorting filters. The LVEF is often placed on the front window of a detector array to suppress second and third order effects.



Linear Dispersion for a LVEF (as expressed in nm/mm) is the slope of wavelength (evaluated at the Half Power Wavelength) as a function of linear position along the filter.

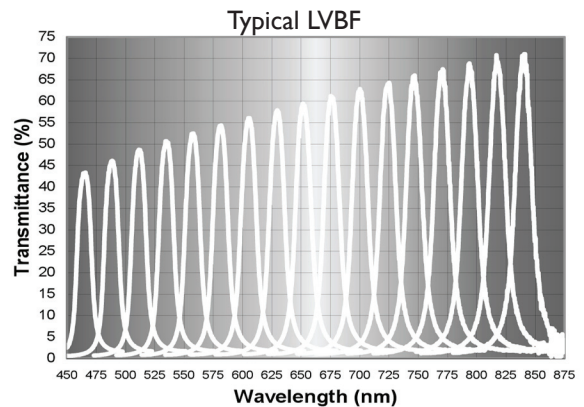
$$\text{Linear Dispersion (nm/mm)} = \frac{(\text{HPWL } 2 \text{ (nm)} - \text{HPWL } 1 \text{ (nm)})}{(X2 \text{ (mm)} - X1 \text{ (mm)})}$$

Where:  
 HPWL 1 = Half Power Wavelength # 1  
 HPWL 2 = Half Power Wavelength # 2  
 X1 = Linear position corresponding to HPWL 1  
 X2 = Linear position corresponding to HPWL 2

A typical value for Linear Dispersion in a Materion LVEF is 10 nm/mm.

### Linear Variable Bandpass Filters

Materion has the capability to design and produce custom Linear Variable Bandpass Filters (LVBF's). Depending upon customer requirements, effective blocking can be afforded over the second and third order transmission ranges.



### Linear Dispersion:

For a Materion LVBF the center wavelength position of the filter (expressed in nm) varies linearly with position (expressed in mm) along the length of the filter. Linear Dispersion for a LVBF (as expressed in nm/mm) is the ratio of wavelength change (evaluated at the Center Wavelength) divided by change in linear position along the filter length.

**Materion** a global advanced materials company, dedicated to providing solutions that enable our customers' technologies and drive their growth. Our products include precious and non-precious specialty metals, precision optical filters, inorganic chemicals and powders, specialty coatings, specialty-engineered beryllium alloys, beryllium and beryllium composites, and engineered clad and plated metal systems. Materion business is structure to enhance our ability to provide customers with innovative, best total-cost solutions.

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