Interference Filters

Features

- 80% peak transmission
- Non-hydroscopic
- Wide bandwidth

Industrial grade wide band pass interference filters

StockerYale now offers Wide Band Pass Industrial Grade Interference Filters, especially suited for machine vision applications. These filters are ideal for imaging wide angle structured light patterns because the angle at which light impinges upon a filter greatly affects how it performs. A common error is selecting a filter with a band pass that is too narrow.

Made with non-hydroscopic films, these filters have much improved longevity in harsh environments compared to standard "off the shelf" soft hydroscopic film filters, which begin to degrade after as little as one year. StockerYale's Wide Band Pass Interference Filters have an anticipated working life in excess of five years.

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Angle of incidence and blue shifting

The center wavelength of the filter will shift toward shorter (blue) wavelengths as the angle of incidence increases; the greater the angle the greater the shift (see % shift vs. angle of incidence graph). This is known as blue shifting. The amount of blue shift may be calculated using the following formula:

$\lambda_1 = \lambda_0 (1 - \sin^2\theta/n^2)^{1/2}$

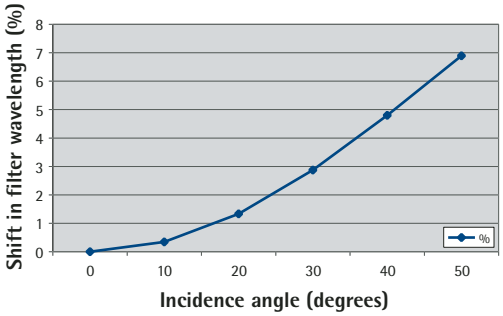
where θ = angle of incidence

λ_1 = resulting wavelength at angle θ

λ_0 = central wavelength at normal incidence

n = effective index of the filter

FILTER WAVELENGTH SHIFT VS. INCIDENCE ANGLE



Laser diode tolerances

Another aspect to take into account when selecting a filter is laser diode tolerances. Diodes typically have a wavelength tolerance of ±10 nm; this wavelength (measured at room temperature) will increase with temperature increases and decrease with temperature decreases at a rate of 0.25 nm/°C.

Available band pass (@ FWHM)

20 nm (0 to 15° angle of incidence)
40 nm (0 to 25° angle of incidence)
70 nm (0 to 35° angle of incidence)

Available center wavelengths

532 nm, 635 nm, 660 nm, 670 nm, 685 nm, 780 nm, 830 nm

Bandwidth tolerances

20 nm + -2
40 nm + -8
70 nm + -14

Center wavelength tolerances (dependent on bandwidth)

+2/-2
+5/-5
+10/-10

Specifications

Transmission at Laser Line	80% Minimum (85% Typical)
Out of Band Transmission	0.001% (50 db attenuation)
Spectral Range	X-Ray to 1150 nm
Effective Index	2.1
Operating Temperature	-20°C to +80°C
Humidity Resistance	Minimum 40 Cycles (MIL-STD-810E) Method 507 Procedure 1
Dimension	25.4 mm (24.4 mm without ring)
Useable Aperture	23 mm ± 0.4
Thickness	4 mm ± 0.25 (3 mm without ring)

Order code

To order a filter, choose the center wavelength and bandwidth from the lists above. The order code is:

<center wavelength> CW - <band pass> BP - 25.4-80%

For example: 635CW-20BP-25.4-80%

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