

Spectrum of Light

What is visible light?

The visible spectrum of light runs from approximately 380 to 700 nanometers and is the range detectable by the human eye. This range features all of the colors of the rainbow from violet to red.

What about light we can't see?

Outside the visible light spectrum are wavelengths that are invisible to the naked eye. On one end are wavelengths of light which are shorter than violet, including ultraviolet (UV) light, X-rays, and gamma rays. On the other end with wavelengths longer than red are infrared (IR) light, microwaves, and radio waves.

Light and optical filters

Optical filters for light in the UV, visible and IR portions of the electromagnetic spectrum are critical components in a variety of applications from scientific imaging, to telecommunications.



What is an optical coating?

Thin film optical coatings use layers of material with varying refraction indices to alter light interaction. By manipulating these layers, we can adjust the optical filter properties, such as transmission and reflection, for enhanced performance.

Material one
Material two
Uncoated glass



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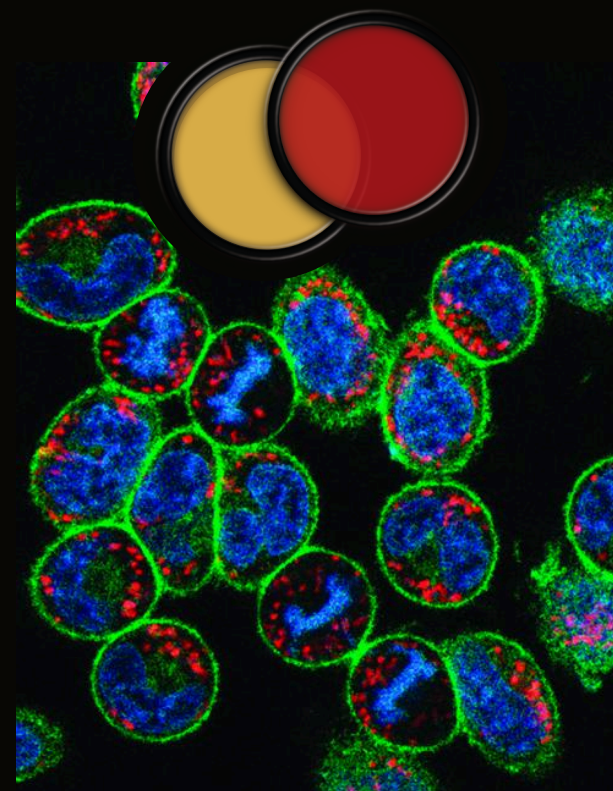
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Optical Filters 101

What's an optical filter?

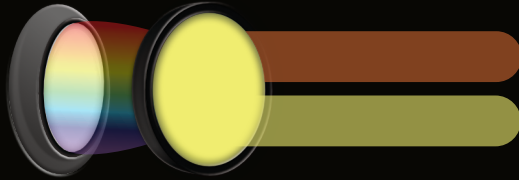
Optical filters selectively transmit and/or block light of different wavelengths passing through them.



Terminology

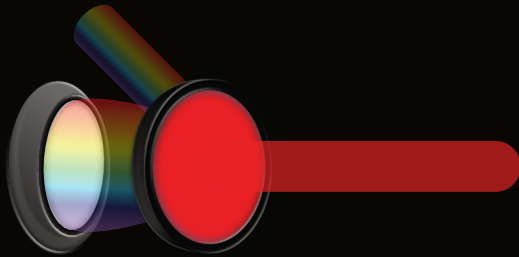
Transmission

The light that is allowed to pass through a filter at specific wavelengths.



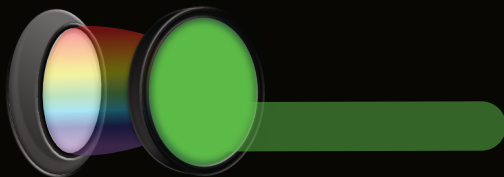
Reflection

When light is caused to bounce off the surface of a filter rather than passing through. Optical filters can be designed to reflect specific wavelengths while transmitting others.



Blocking

The opposite of transmission. The portion of light that is not allowed to pass through the filter. High blocking eliminates unwanted light. Blocking happens via either absorption and/or reflection.



Machine Vision



Optical filters help machine vision systems quickly identify problems, such as bruised produce by isolating the specific colors that indicate quality, ensuring only the best reaches consumers.

Life Science



Optical filters empower life sciences by aiding in cellular imaging via fluorescence microscopy, chemical analysis through Raman spectroscopy, and DNA analysis in PCR systems.

Astronomy



Astronomers use optical filters to block unwanted light, isolating specific wavelengths to study celestial objects' composition and properties in detail.

Color Matching



Optical filters are crucial for color matching, ensuring displays & print media present colors as they are meant to be seen.

Shortpass

Filters that transmit wavelengths shorter than the cut-off and block longer wavelengths.



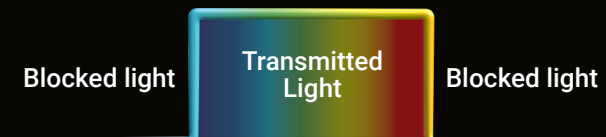
Longpass

Filters that transmit wavelengths longer than the cut-on and block shorter wavelengths.



Bandpass

Filters which transmit a specific range (band) of wavelengths while blocking others.



Notch

Filters which block a specific range of wavelengths from transmitting. The inverse of a bandpass.

