



SPECTRA PLUS

PATENTED COLOR IMAGE ENHANCEMENT FILTER

OVERVIEW

Omega Optical's image enhancement coating, SpectraPLUS™, is a triple bandpass/dual rejection band interference coating that enhances color and improves overall spectral performance in all color imaging systems. It is covered by U.S. Patent #5646781.

The coating transmits pure blue, green, and red bands, while rejecting the regions between the bands of pure color that distort the perception or recording of color. The coating also eliminates wavelengths in the ultraviolet and near infrared, which are detrimental to accurate color rendering.

All sensors have limitations in how they "see" and record color. Detectors have significant overlap, as do the wavelengths for the three prime colors of light—red, green, and blue. A photon of light from within this overlap region can leave an incorrect signal on the detector.

All optical imaging systems suffer from dispersive and resulting chromatic aberrations that limit the ability to record the color image of an object with precision. Lenses are designed to select the peaks of the three primary colors and focus them on a common image plane. As a result, colors other than pure red, green, and blue are not well focused.

SpectraPLUS results in enhanced color rendition (sharpness, hue, and saturation), increased color signal-to-noise, and improved Modulation Transfer Function (MTF) in all digital projection and image capture systems, including HD cameras, video cameras, digital still cameras, digital projectors, and HD projection systems.

PROJECTION SYSTEMS

DCP/DLP projection technology utilize a version of the SpectraPLUS™ coating in their light engine assemblies.

Digital projection technology attempts to reproduce color accurately and efficiently. A SpectraPLUS™ coating incorporated in the optical path eliminates the wavelengths of "crossover confusion" between the prime color bands, resulting in enhanced color rendition of all projected images.

Omega Optical holds a patent on the SpectraPLUS™ color enhancement coating.

CAMERA/LENS SYSTEMS

Camera/lens systems can benefit from the use of a SpectraPLUS™ coating in their optical system.

Imaging sensors, such as CCDs and PMTs, utilize prisms and filters to divide the spectrum into bands of color, which then activate individual pixels in a large or distinct array. SpectraPLUS eliminates wavelengths between the prime color bands, resulting in digital images which more closely match the color space of motion picture film.

SpectraPLUS™ has been specified in a new Panavision patented lens system that uses interference filters in a collimated light space for the purpose of spectral modification.

FEATURES

- Triple bandpass interference filter
- Transmits bands of pure color—R,G,& B
- Blocks crossover bands between R,G,& B
- Attenuates ultraviolet
- Attenuates near infrared
- Enhances color saturation and hue
- Increases color signal-to-noise
- Improves Modulation Transfer Function (MTF)



INTELLECTUAL PROPERTY

Omega Optical's SpectraPLUS™ coating is protected by U.S. Patent #5646781.

This patent covers any interference coating which blocks passbands centered substantially at 490nm and 590nm and transmits light at the wavelengths of the three prime color bands centered at approximately 450nm, 530nm, and 650nm.

Panavision's parallel light space lens system is protected by U.S. Patent #7006141.

The Panavision lens is designed specifically to incorporate SpectraPLUS™ and other interference coatings into the lens in order to modify the spectral characteristics of the image that is captured. The SpectraPLUS™ coating and patent are cited in the Panavision patent.

Licensing and Joint Ventures

Omega Optical is interested in discussing licensing and joint venture partnerships involving digital imaging and projection technologies and applications.

SPECTRAL PERFORMANCE

Any triple bandpass coating which blocks wavelengths centered substantially at 490nm and 590nm and transmits the three prime color bands centered at 450nm, 530nm, and 650nm is covered by Omega Optical's patent for SpectraPLUS™.

Many version of this coating design can exist, with the depth and range of blocking at the wavelength regions between the prime color bands being variables.

Below are several examples of the patented coating, including coatings which are used in the light engine of Digital Cinema Projector technology (DCP).

SPECTRAPLUS COATING EXAMPLES

