

Optical Solutions for Biomedical Applications



VIAMI technologies are ideal for demanding applications that require high contrast performance, wavelength agility, and 24/7 reliability. Our patented low angle shift (LAS) bandpass filters enable instrument miniaturization and improve signal collection. VIAMI Engineered Diffusers® generate best in class uniform illumination beams with efficient light management. Our durable wafer level patterned coatings are enabling novel biosensors and continuous healthcare monitoring devices.

VIAMI products are relied upon in a wide variety of medical diagnostic, life science instrumentation, and health care applications.

We uniquely combine quality, performance and low-cost solutions in our offerings, while de-risking supply chain with our facilities and teams based in US and Asia.



OPTICAL SOLUTIONS FOR FLUORESCENCE IMAGING

Thin Film Optical Coatings

VIAVI hard-coated thin film optical filters provide precise spectral edge placement, improving accuracy of quantitative imaging applications such as Polymerase Chain Reaction (PCR), DNA sequencing and spatial biology. Steep spectral edges combined with high transmission and high blocking improves fluorescence signal collection and enables high-multiplexing assays.

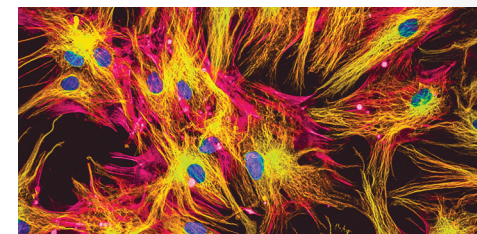
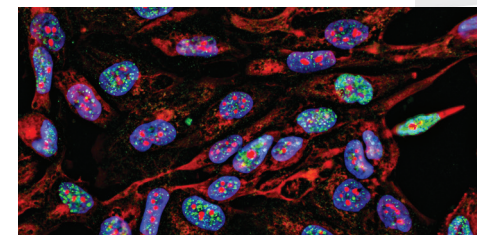
In the pathway of the illumination beams, VIAVI filters provide >90% transmission from UV to NIR and help maintain wavefront quality of the incident beam to ensure focused illumination spots. Within the emission beam's trajectory, tight wavefront control facilitates diffraction-limited imaging performance in fluorescence imaging. When positioned within the emission light pathway, VIAVI Notch Filter enhances the signal-to-noise ratio (SNR) by effectively blocking excitation or stray light.

To enable miniaturized instruments with high sensitivity, VIAVI provides several enabling technologies. This includes low angle shift (LAS) filters in instruments that require narrower bandpass filters than traditional thin film coatings when imaging a wide field of view, absorbing coatings that provide effective suppression of stray light even with >90° angle of incidence, and 0.2 mm thin glass substrates, or wafer level coatings leading to reduced form factor.

Light Shaping Optics

VIAVI Engineered Diffusers® help generate uniform illumination beams with minimal transmission loss, enhancing throughput in fluorescence imaging and enabling reduced cost DNA sequencing and spatial biology instruments. Customized beam shaping and wavelength agnostic performance of our products, sends light where its needed, matching illumination field of view with the imaging sensor, reducing photobleaching, improving signal-to-noise ratio and throughput, while minimizing system complexity and reducing cost.

Our Polymer-on-glass based Microlens Arrays are at the heart of low-cost confocal instruments, and Vortex Phase Plates provide precision wavefront control and are a key enabler for the super-resolution imaging microscopes. For fluorescence instruments utilizing high power lasers, our Reactive Ion Etched (RIE) products provide high laser damage threshold performance with peace of mind.

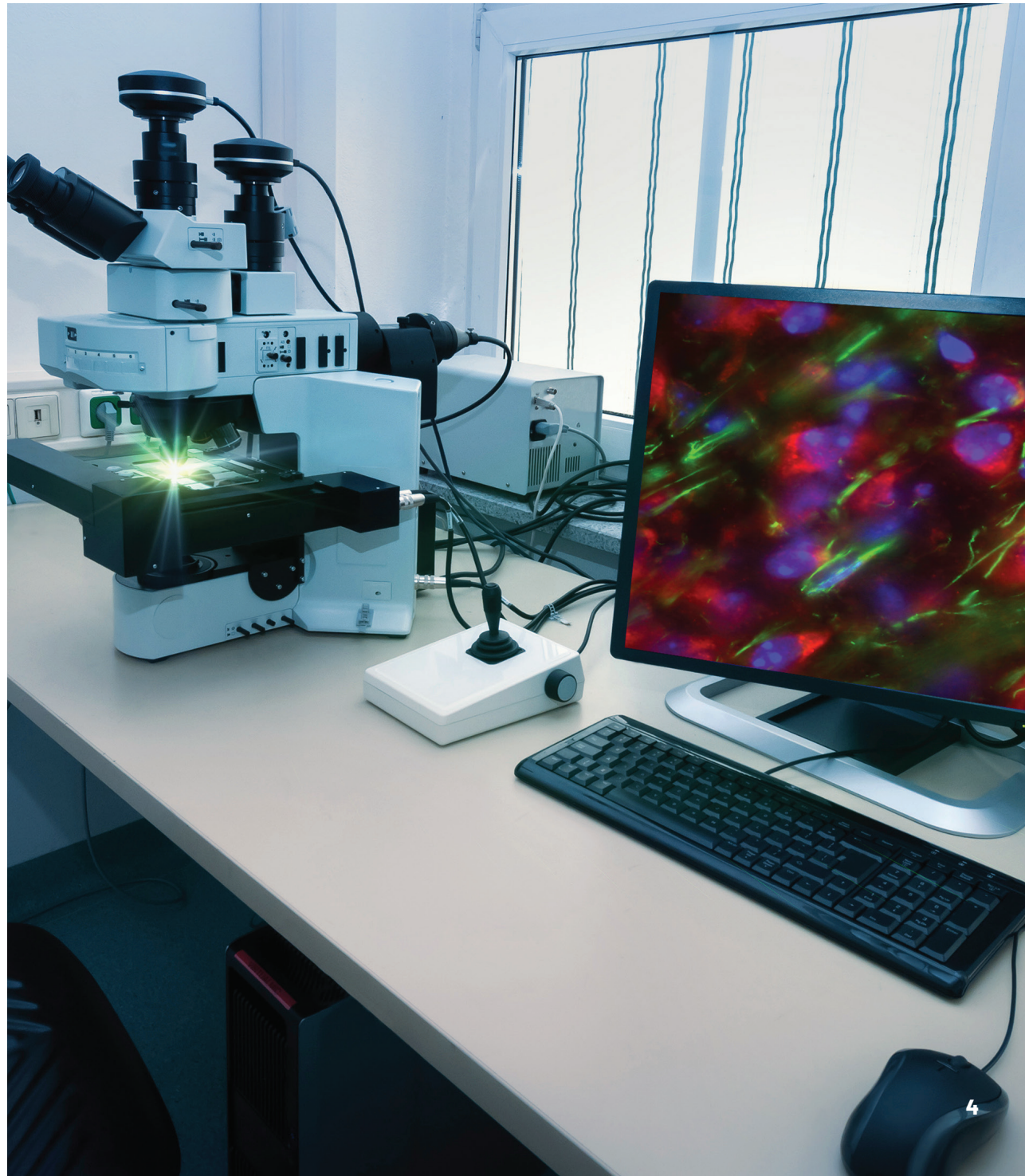


Applications

- Polymerase Chain Reaction (PCR)
- DNA Sequencing
- Flow Cytometry
- Microscopy
- High-content Screening
- In-Vivo Imaging

VIAMI Product Offerings

- Thin Film Optical Coating
- Bandpass/edge Filters
- Dichroic Beamsplitters
- Notch Filters
- UV to Mid-infrared Coatings
- Low Angle Shift (LAS) Filters
- Mirrors
- Light Shaping Optics
- Engineered Diffusers
- Vortex Phase Plates
- Diffractive Optical Elements
- Microlens Arrays



OPTICAL SOLUTIONS FOR LASER AESTHETICS APPLICATIONS

Light Shaping Optics

VIAVI Engineered Diffusers® enable uniform illumination beams with sharp contrast and no zero-order hotspot to enhance customer feel and experience and ensure desired treatment outcomes. Our proprietary materials enable wide field of view (FOV) diffusers for faster body contouring and fat removal treatments. In addition to improved outcomes for treatments, the VIAVI refractive design approach to manufacture Light Shaping Optics reduces instrument complexity and cost by providing wavelength agnostic performance over a wide spectral range.

The VIAVI Diffractive Optical Elements (DOE) Arrays and Microlens Arrays create precise dot patterns for laser aesthetic treatments. Our highly robust Reactive Ion Etched (RIE) products provide enhanced efficiency of light management in high power illumination instruments. Polymer-on-glass products offer low-cost solutions for disposable devices. Our wafer level manufacturing process ensures consistent product performance at reduced cost.

Thin Film Optical Coatings

VIAVI hard-coated optical filters provide spectral purity and consistency of illumination beams ensuring desired outcomes in skin rejuvenation treatments. Tattoo removal and similar skin treatment applications benefit from Dichroic Beamsplitters and Mirrors that minimize wavefront aberrations and reduce laser pulse broadening, thereby enabling deep tissue penetration and effective medical procedures. Eye safety in clinical applications is enabled by Notch Filters that provide deep blocking at illumination wavelengths.





Treatments/Applications

- Face and Body Contouring and Tightening
- Skin Rejuvenation and Resurfacing
- Hair Removal
- Tattoo Removal
- Ophthalmology
- Dental Procedures

VIAMI Product Offerings

- Engineered Diffusers
- Dot Projection Optics
- Microlens Arrays
- Bandpass/Edge Filters
- Dichroic Beamsplitter
- Notch Filters
- Mirrors



OPTICAL SOLUTIONS FOR PERSONALIZED HEALTHCARE MONITORING

Thin Film Optical Coatings

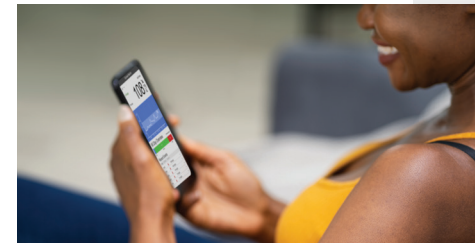
VIAVI durable patterned coatings on wafers serve multiple purposes: they eliminate glass-substrate based fluorescence filters, reduce device size and enable the creation of low-cost biosensors for precision medicine. Dark Mirror coatings are designed to prevent stray light by absorbing non-transmitted light, reducing crosstalk between multiple wavelength channels in miniaturized devices and improving confidence in diagnostic analyses.

Our patented low angle shift (LAS) filters enable compact instruments that require narrower bandpass filters than traditional thin film coatings when imaging a wide field of view and help improve signal-to-noise ratio. LAS filters with wide-band blocking capabilities effectively blocks both illumination and ambient light, even at high angles of incidence which enables the detection of weak fluorescence signals, as seen in continuous glucose monitoring.

Induced Transmission Filters provide enabling technology that facilitates signal collection across a wide 180° field of view (FOV) in wearable point-of-care (POC) devices. The utilization of wafer-level solutions ensure cost-effectiveness in the development of POC disposable solutions. Multispectral Filter Arrays enable dense, multiplexed spectral sensing for healthcare monitoring applications. Wafer level meta-materials coatings offer precise control of coating thickness and ultra-low surface roughness for metastructures for emerging biosensors and devices.

Light Shaping Optics

VIAVI Engineered Diffusers® enable uniform beam illumination and customized beam shaping that improve the accuracy of quantitative measurement techniques and send light precisely where its needed. Our Polymer-on-glass (PoG) products with 0.2mm thin glass substrate, effectively reduce device size and enhance ease of use. These products utilize reflow compatible material with 300 mm diameter production wafers, enabling wafer level integration in compact sensing systems. Our Reactive Ion Etched (RIE) products enable environmentally durable products suitable for wearable devices with prolonged instrument lifetime.



Applications

- Glucose Monitoring
- Wearable Devices
- Implantable Devices
- Spectral Sensing

VIAVI Product Offerings

- Thin Film Optical Coating
- Wafer Level Patterned (WLP) Coatings
- Induced Transmission Filters
- Low Angle Shift (LAS) Filters
- Meta-materials Coated Wafers
- Dark Mirror Absorbing Coatings
- Light Shaping Optics
- Engineered Diffusers
- Polymer-on-glass (PoG)
- Reactive Ion Etching (RIE)





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