NVIS, Dual Mode, NVG Compatible Filters for Displays & Lighting

Avionics ● Cockpit Displays ● Ground-Based Instruments ● Night Vision

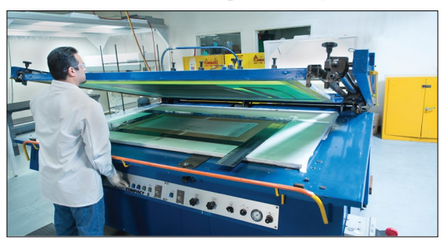
Glass Fabrication

Coating Deposition

CNC Machining

Strengthening - Chemical & Heat

Screen Printing of Graphics



Abrisa Technologies, a member of HEF Photonics, is a globally recognized technology glass fabrication and optical thin film coating company with expertise in high volume manufacturing and engineering capabilities, delivering Total Solutions that provide excellent performance, fitness-for-use and economies of scale.

Our US based, state-of-the-art ISO 9001:2015 and ITAR registered facilities include Abrisa Industrial Glass in Santa Paula, CA and ZC&R Coatings for Optics in Torrance CA. These two divisions produce solutions from cut-to-order coated glass components to custom complex and ready-to-install fabricated, strengthened, optically coated, electronically enabled and branded sub-assemblies.

Our Total Solutions serve a variety of markets including Micro-Electronics, Defense and Avionics, Display, Industrial Automation, Optical Sensors, Imaging, Photonics, Medical & Dental, Life Science and more.

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NVIS 0723

ABRISA TECHNOLOGIES
HEF® PHOTONICS

Your Total Solution Partner

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ZC&R Coatings for Optics (ZC&R), a division of Abrisa Technologies, has over 20 years of design and volume manufacturing experience for high performance thin film coating solutions for Night Vision Imaging Systems (NVIS) and Night Vision Goggle (NVG) compatible lighting and displays.

ZC&R collaborates with customers to tailor NVIS coating solutions to meet the performance defined by MIL-STD-3009 when mated to THEIR chosen light emitter and display. Our thin film engineers will define the coating specs needed for the integrated assembly to meet the NVG compatibility limits on red and NIR radiance limits, cut-off and slope requirements with industry leading high throughput performance. After validation, we launch into production with a Copy Exact process for a repeatable and consistent result. We gladly support new designs as your technology roadmap evolves.

Night Vision Imaging

Key Advantages:

- Designs to Meet MIL-STD-3009 with YOUR Display & Li**ght** Source
- Sharp Cut-Offs, High Visible Radiance & MIL STD Blocking
- Robust MIL-SPEC Severe Abrasion, Fast Pull Adhesion
- Meets Durability & Environmental Requirements of MIL-C-48497A
- In-House Testing: Environmental, Transmittance, Specular & Diffuse Reflectance
- USA - Extensive Glass Inventory, Fabrication, Glass Strengthening, Coating
- Easy-Clean Scratch Resistant Oleo/Hydrophobics
- Other Filters: Covert, EMI, Heater, Anti-Reflection (AR), IR Filters
- Float, Non-Glare (Sunlight Readable), AR, Corning® Eagle XG®
- Ultra-Thin, Ultra-Light HIE™ Aluminosilicates 0.1-1.1mm
- NVIS Filter Sizes from mm's to 19" x 19"

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NVIS allows authorized personnel to view instrumentation displays for monitoring, navigation, controls, and communication in total darkness while preventing detection by unwanted parties. NVG's, however, can get oversaturated by too much radiance in the deep red/NIR leading to blooming. Special NVG compatible filters and display enhancement glass is needed to suppress the unwanted emissions and maintain the contrast needed for optimal viewing performance.

Military Night Vision Compatibility Standard, MIL-STD-3009, was issued in 2001, with detailed chromaticity, spectral performance, cut-off wavelengths, and limits to NIR radiance required of NVIS displays and lighting so as to be deemed NVG compatible. Many available NVIS filter solutions were optimized to work with specific light source and display output characteristics popular in the past. Unfortunately, these solutions do not guarantee meeting MIL-STD-3009 when mated to newer brighter LED sources and updated LCD and OLED displays with their higher throughput efficiency and different spectral radiance characteristics. ZC&R Coatings for Optics is Your Total Solution Partner for NVIS filters designed and optimized to meet STD-3009 when mated with YOUR displays and light sources so you can focus on new system builds and retrofit modernization.

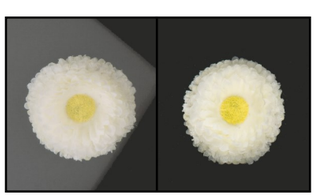
Night Vision Compatible Coated Glass Filters (Sizes from mm's to 19" Square)

- **NVIS Red**
- **NVIS Green A & B**
- **NVIS White/Full Color**
- **NVIS Yellow**

Other Display Glass & Coating Solutions

IMITO - EMI Shielding

Sunlight Readable Non-Glare (NG) Glass



MIL-SPEC AR Coatings

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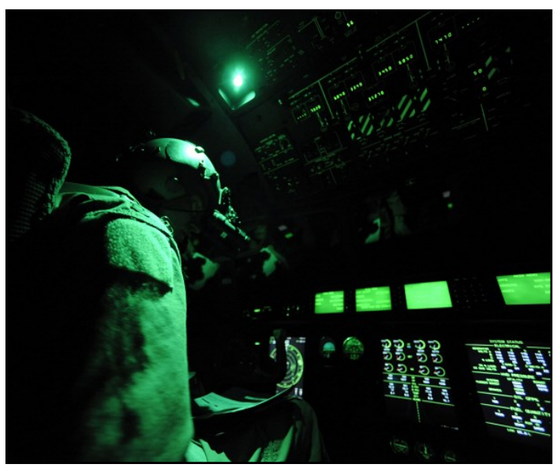

Options

Coatings:

- Custom V-Coat, Multi-band, Broadband AR
- AR Coatings to MIL-C-14806 A
- ITO/IMITO for EMI Shielding, Heater, LC Devices
- Custom SWP, LWP, Bandpass, UV & NIR Blocker
- Broad/Narrowband Scanning Mirror Coatings
- Deposition onto Filters, Silicon & Other Materials
- Autoclavable, Bio or Chemically Compatible

Substrates:

- **Fabrication to Shape & Size**
  - Cut & Seam or Circle Ground to Size & Shape
  - Precision CNC - Holes, Bevels, Steps, Notches
- **Damage Resistant Substrates**
  - HIE™ Aluminosilicates
    - AGC Dragontrail™
    - Corning® Gorilla®
    - SCHOTT AS 87
  - Chemically Strengthened Soda Lime Float
- **Low Expansion Chemically Resistant Substrates**
  - SCHOTT BOROFLOAT® 33
- **Ultra Thin and Wafer Substrates**
  - AGC EN-A1
  - Corning® Eagle XG®
  - SCHOTT AF32, D263® & AS 87
- **Other**
  - Applied Films & Tints
  - Gasket Application
  - Edge Treatment/Blackening
  - Laser Marking (QR & Barcodes, S/N)

Easy-to-Clean & Anti-Fog Solutions:

- Oleo/Hydrophobic Options
- ITO Heater, HTAF Anti-Fog Solutions

Graphics & Bus Bars:

- Color Matched Epoxy Ink
- Non-Conductive Ink
- High Temperature Frit Ink
- Dead Front Ink - Partially Transmissive
- Infrared IR Transmitting Ink
- Silver Epoxy, Silver Frit, CrNiAu Bus Bars