Q-FLEX
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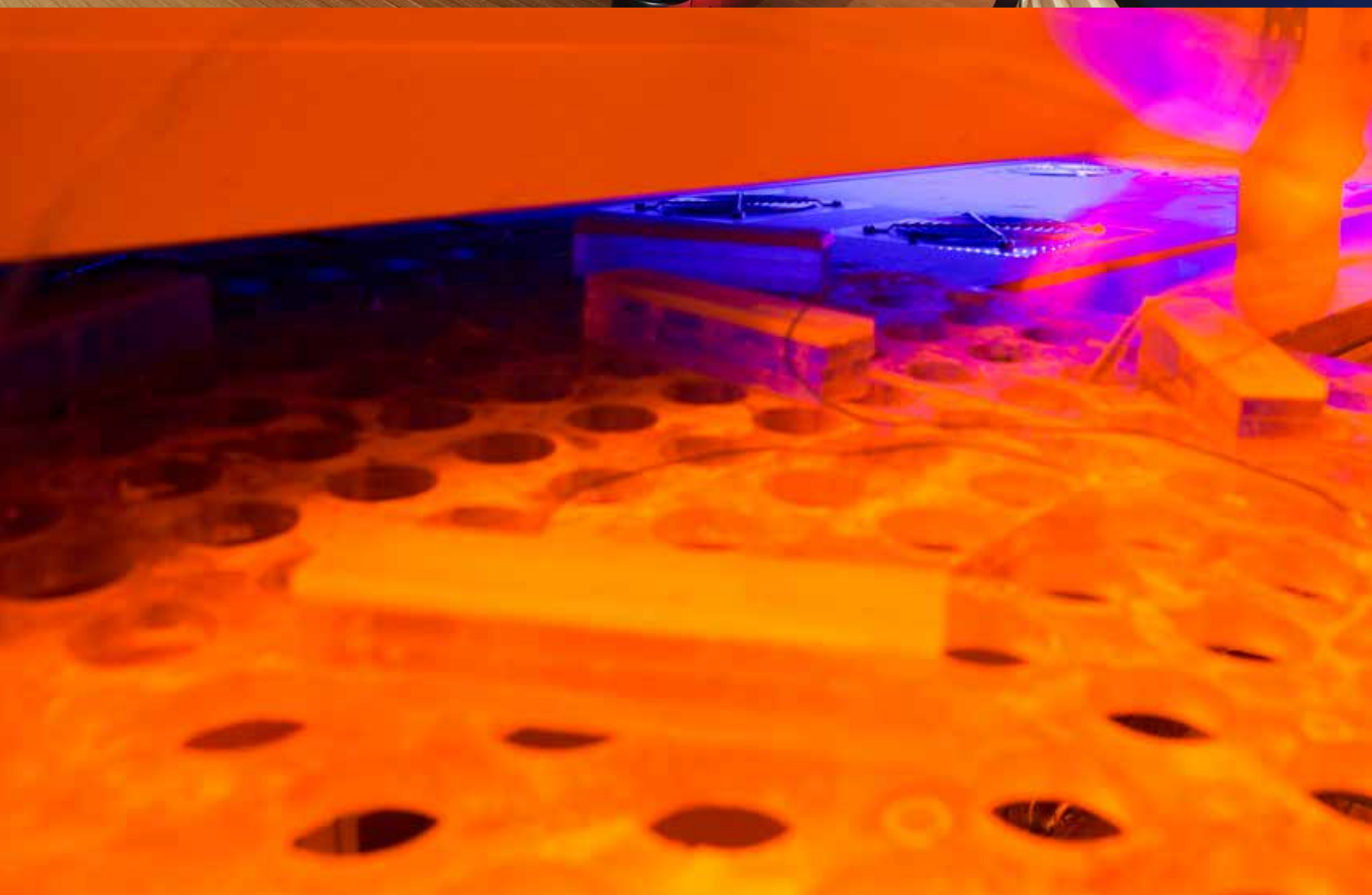



OPTICAL
FILTERS

Innovation on display

Reliability founded on experience

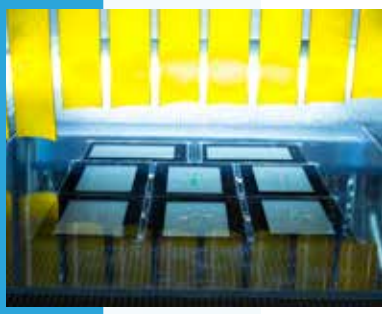
Optical Filters designs and manufactures an array of products to improve the function and quality of the electronic display interface. Founded in 1988, the company draws on extensive experience in optical design and development to offer innovative solutions to improve and protect display function and durability. With manufacturing facilities in Europe and U.S., and sales representatives across the globe, Optical Filters assures highly efficient project management and responsive customer service.

Comprehensive, sophisticated manufacturing capabilities supported by extensive research and testing enables Optical Filters to deliver consistently high-quality products with short lead times. The company has the versatility to manage custom display enhancement for specialized niche applications, as well as large-volume production.

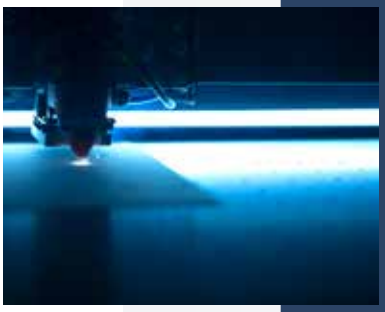
Solutions for challenging environments

Extreme temperatures, harsh sunlight, electromagnetic and radio frequency interference, potential for impact and other challenging environmental conditions are detrimental to displays. Optical Filters manufactures a full spectrum of EMI-shielded displays, transparent heater windows, ruggedized displays and laminations to improve sunlight readability to manage the adverse environments frequently encountered in many applications including medical, telecommunications, avionics, construction, marine and defense.

Optical Filters' display interface solutions are the result of technical know-how, advanced manufacturing and assembly, exhaustive research and testing, and close collaboration with our customers.



Extensive research, testing and product development



Proprietary in-house R&D

Dedicated research and design facilities enable the company to deliver responsive, technically advantageous solutions to meet precise customer requirements. Quality assurance is a cornerstone of our approach, and Optical Filters is an ISO 9001:2008 certified company. The company's in-house laboratory offers a broad range of analytical services. Capabilities include optical measurement, environmental cycling and material-performance testing.

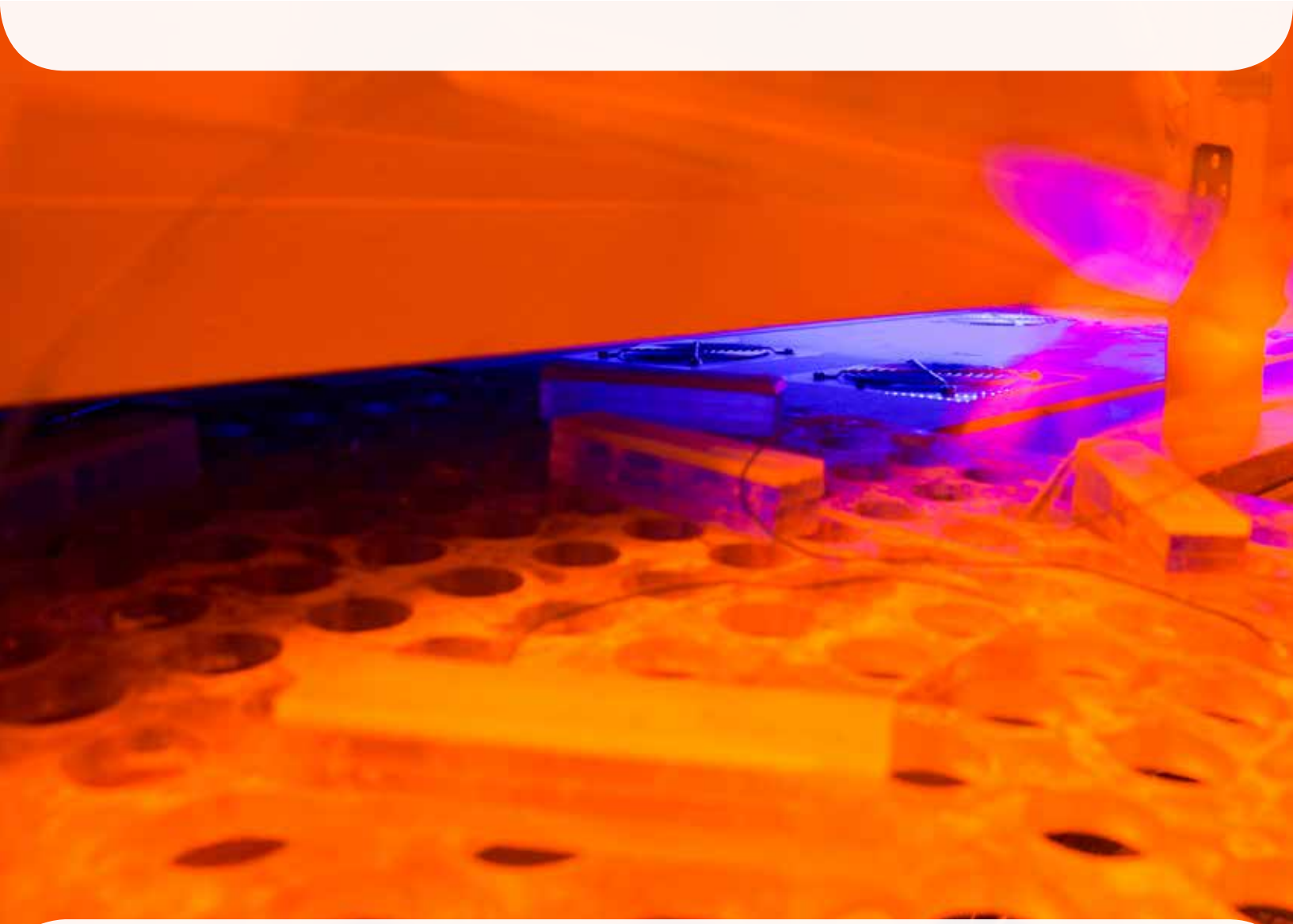
New product development is a priority at Optical Filters, a strategy that ensures the application of the advanced materials and processes for optimizing product performance. Innovations such as the development of our unique Vizbond™ wet bond, a high-volume, high-yield system for bonding delicate components such as LCDS and the second generation of MicroMesh™ (MM2), offering improved light transmission and EMI shielding that is superior to ITO coatings for shielded display and touch screens, are evidence of the company's commitment to creating more effective and economical display solutions for its customers.

MICROMESH

Refining manufacturing processes

Continuous quality improvement measures at Optical Filters are also concentrated on process development. The company's class 100 and 1000 assembly environments integrate custom contamination control features to meet the most demanding quality requirements. And our skilled operators are well versed in material handling protocols.

Optical Filters' engineering team has substantial knowledge of products and processes, and works closely with customers to create optimum designs for their systems. Prototypes can also be developed to serve as models for optical filter performance to meet customer specifications.



VIZ-BOND

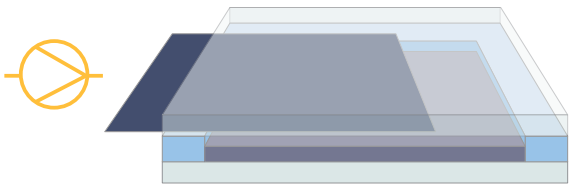
VIZ-BOND

The Viz-Bond Process

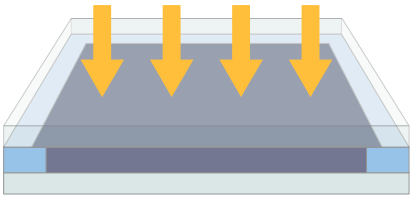
1 Clean and prep surfaces

2 Deposit sealing and height gasket

3 Clean room assembly



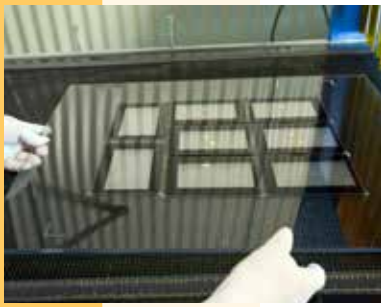
4 Fill with index matched optical adhesive



5 Full visible cure

Lamination and bonding expertise

Experience matters in optical bonding, and Optical Filters offers expertise from years of developing and refining laminating and bonding techniques. Equally important, the company continually invests in leading-edge technologies to ensure its customers optimal value. Optical Filters' comprehensive capabilities include dry film, PSA lamination, and its proprietary Viz-Bond™ wet bonding system. Substrate materials encompass glass, plastics and film, and silk-screening services are also provided.



Dry film lamination

Optical Filters' dry film lamination is well suited for display applications whose criteria include stringent optical or environmental performance. The process may be used with all types of substrates, and is scalable for volume and size.

PSA lamination

Optical Filters has extensive experience laminating pressure-sensitive adhesives (PSA) or optically clear adhesives (OCA). This technique is ideal for application of thin, flexible substrates including privacy films and P-CAP touch sensors.

Viz-Bond™ wet bonding

Optical Filters' Viz-Bond™ process uses a liquid adhesive to bond filters together rather than a dry film process, enabling it to incorporate materials that cannot withstand the heat and pressure of the dry film process.

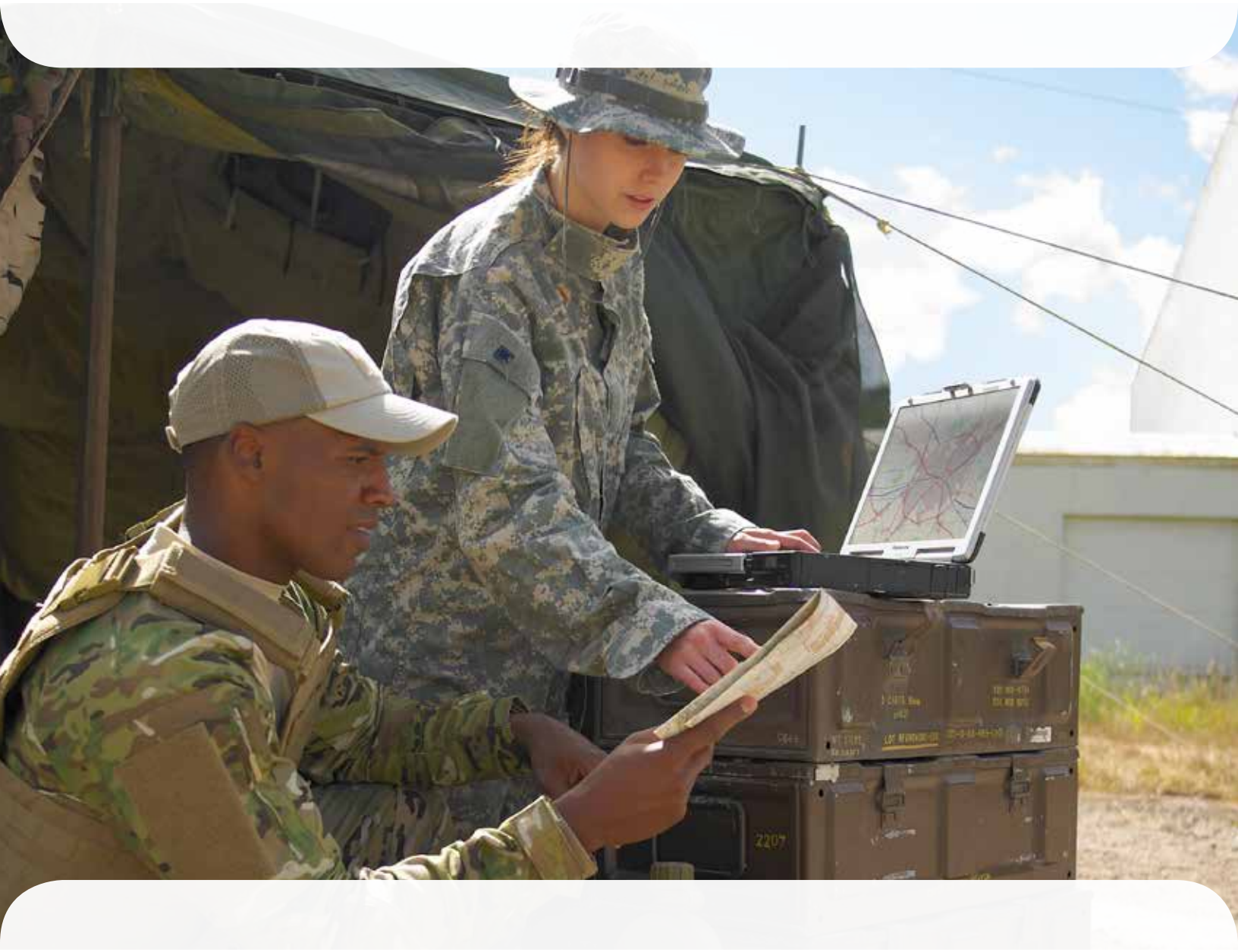
The index-matched wet-bond adhesive reduces internal reflections in the optical stack thereby improving readability in sunlight. With automated dispensing, this reworkable system is reliable and scalable to large volume.

VIZ-BOND

Ruggedized Displays

Optical Filters offers an array of solutions for protecting displays in hazardous environments such as transit terminals, defense equipment, construction sites, hospitals and public kiosks and cash machines. Ruggedized displays are constructed from plain glass or polymer substrates, or feature anti-reflective, anti-glare coatings.

Rugged displays are laminated so that the window remains intact and protects the display underneath from damage. Layers can be constructed to produce a multifunctional rugged filter such as a heater optically bonded with the Viz-Bond™ process to an LCD resulting in a durable, sunlight-readable display that can be quickly powered up in cold temperatures.




SIEMENS
SOMATOM
Definition AS

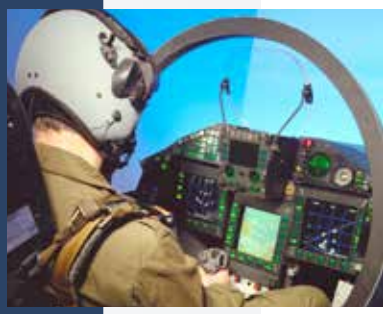
EMI-Shielded Displays

EmiClare™

Optical Filters EmiClare™ range of EMI-shielding filters offers maximum shielding performance with no optical compromise.

These unique products by Optical Filters are specifically designed for use on electronic displays and provide excellent optical performance without sacrificing shielding attenuation.

Proven in the field, the EmiClare™ range is widely used in many applications including medical, defense test equipment, in-flight entertainment and communications.



These solutions include:

- EmiClare™ woven mesh, ITO-coated film and glass
- EmiClare MicroMesh2™, the second generation of Optical Filters' micro-replicated conductive grid, utilizes a fine-line conductive pattern to offer the combination of higher light transmission and low surface resistance that is not achievable with ITO coatings, together with low-diffuse reflectance to produce better sunlight readability performance.

EMICLARE

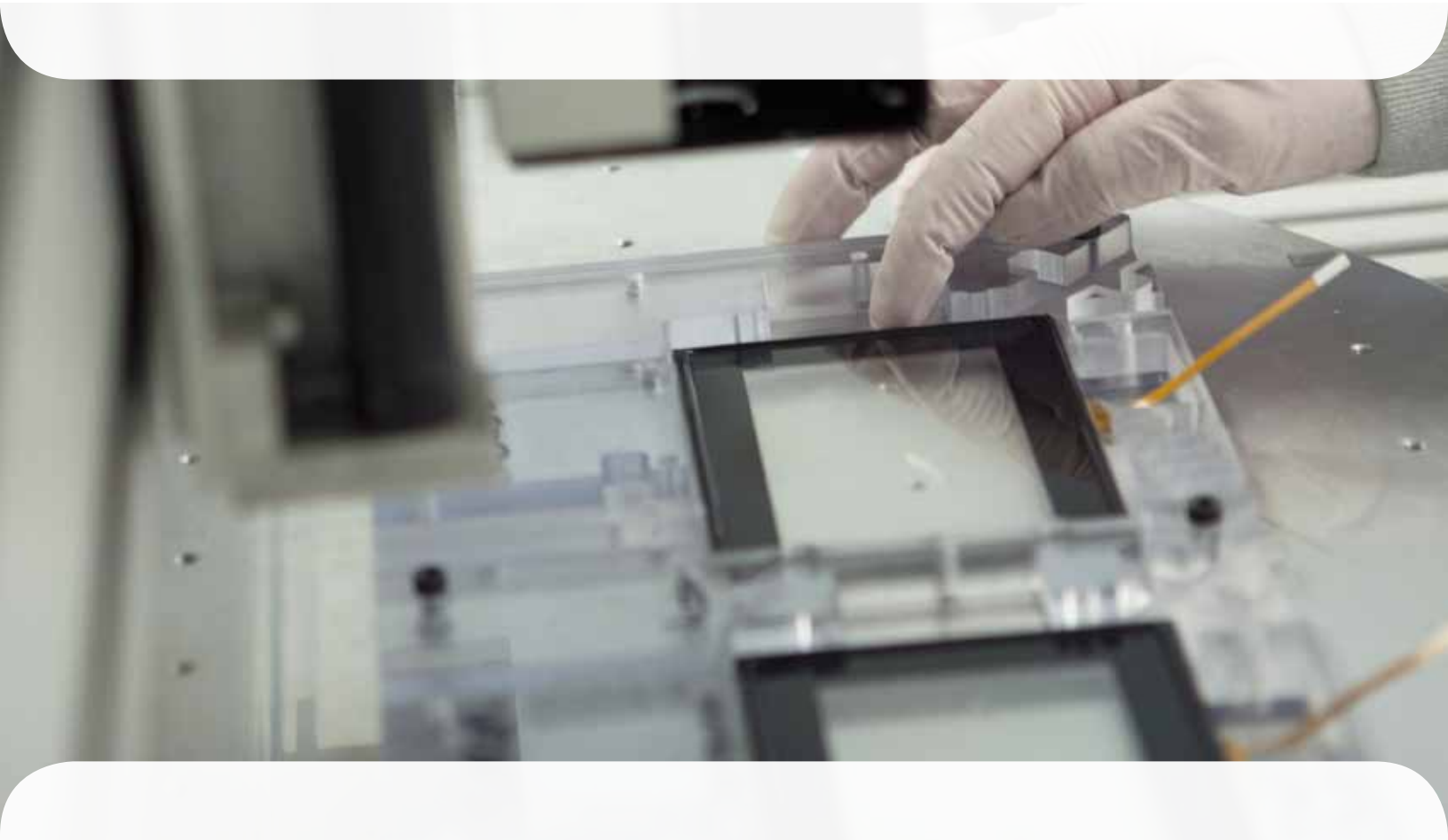
Touch Screen Enhancement

Touch Screen Lamination and Ruggedization

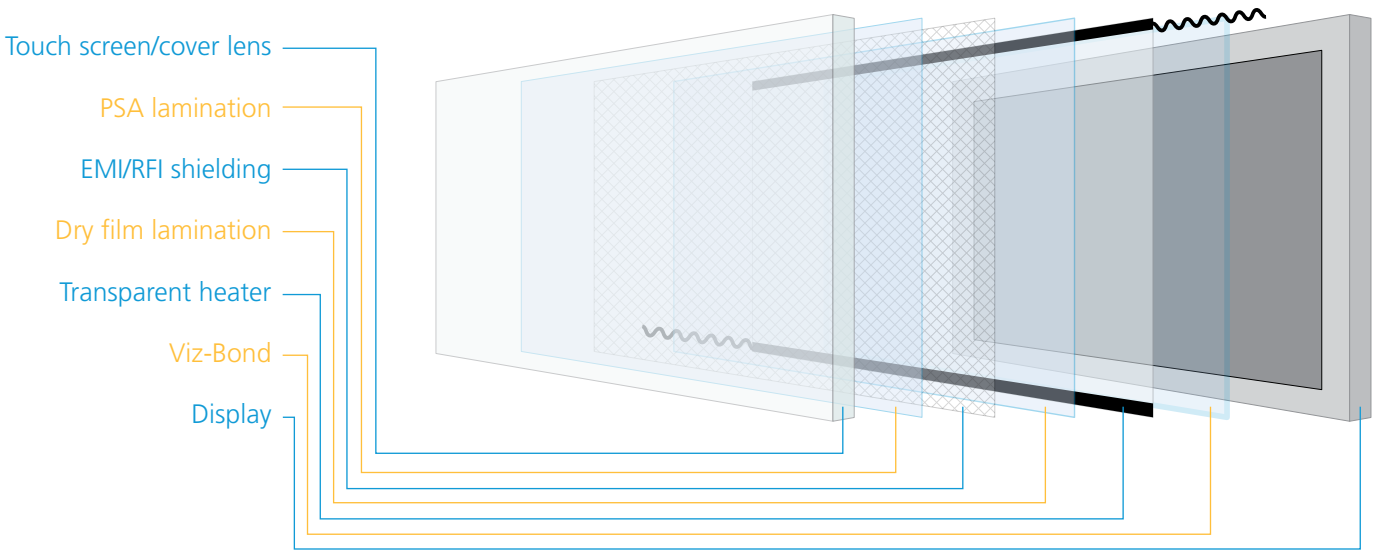
Optical Filters' enhanced touch screens are assembled in Class 100 clean room conditions using PSA, dry film or Viz-Bond™ lamination techniques. This high clean room standard excludes contamination from the optical sandwich.

Full optical lamination improves impact resistance of the sensor and enables the screen to remain intact when broken, protecting both the equipment and user. Extra lamination layers and chemically toughened glass may be used to add additional strength. Utilizing Optical Filters' in-house printing capability, printed masks or cover glass may be included in the stack.

Sunlight readability and environmental performance (impact, shock temperature and humidity) are delivered at new levels of performance through full optical bonding with the Viz-Bond™ system. A louver privacy film can be readily incorporated into a touch screen lamination to form a computer privacy screen for such applications as ATMs and public kiosks. Transparent heaters and near infrared (NIR) radiation control may be introduced into the lamination, as well as EmiClare™ EMI-shielding.



From component filters to fully integrated display head assemblies (DHAs)



Optical Filters. Innovative. Experienced. Dependable.

The technical experience and expertise we bring to display enhancement is complemented by our commitment to building strong, collaborative relationships with our customers. This trust is evidenced not only in the dialogue we establish regarding engineering and design, but also in our commitment to delivering quality products that enhance the value of our customers' displays.

To learn more about Optical Filters' capabilities, visit **www.opticalfiltersusa.com** or **www.opticalfilters.co.uk**.

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