

DONTECH EDS - ENHANCED DISPLAY SOLUTIONS

Providing solutions for your display goals



- High Ambient Light Viewability
- EMI/RFI Shielding
- Low Temperature Operation
- Night Vision Imaging System (NVIS) Compatibility
- Solar Loading Reduction/Heat Shielding
- Ruggedization





HIGH AMBIENT LIGHT VIEWABILITY

Design Goal: Improve contrast so when energized, the display is readable in any lighting condition. For applications where the display must be readable regardless of orientation or ambient light source location (sun, surgical lights, etc.).

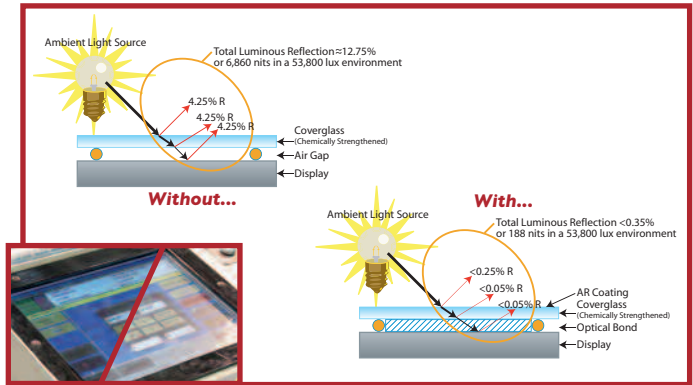
Dontech Solutions:

Passive – improve contrast without increasing power consumption

- Antireflective (AR) coatings – optically bonded cover glass or film
- Polarizers, backlight enhancement films, diffusers and light guides – upgrades to improve efficiency
- Contrast enhancement filter (e.g., triple notch filter)
- Optical bonding and lamination

Active – increase luminance

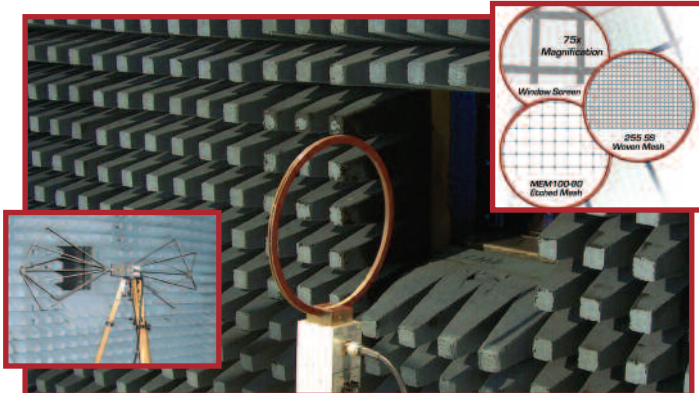
- LED or CCFL replacements – high bright solutions, improved bulb efficiency



OPTICAL BONDING & LAMINATION

Design Goal: Improve sunlight readability and ruggedization.

Dontech Solutions: IMO-bond™ is Dontech's proprietary process of applying rigid optical filters (e.g. antireflective, conductive antireflective, or Therma-Klear™ transparent heaters) to electronic displays via a refractive index matched optical (IMO) bonding process. IMO-bond™ includes a family of durable, index matched adhesives that optically couple a cover glass or touch screen to the display to eliminate reflection losses.



EMI/RFI SHIELDING

Design Goal: reduce or eliminate electromagnetic/radio frequency interference (EMI/RFI) emitting from the electronics system, or prevent system failure due to environmental EM/RF radiation.

Dontech Solutions: Conductive Optical Grids – blackened to improve contrast with orientation optimized to eliminate moiré interference.

- Woven Mesh – 24 to 255 opening per inch mesh, 0.001” to 0.004” wire diameter
- Patterned Mesh – customizable to any mesh count or pattern, 0.0005” line width

Conductively Coated Glass or Films – <math><1</math> to 250 ohms/sq, dielectrically enhanced/index matched to air, substrates, or optical bonding adhesives.

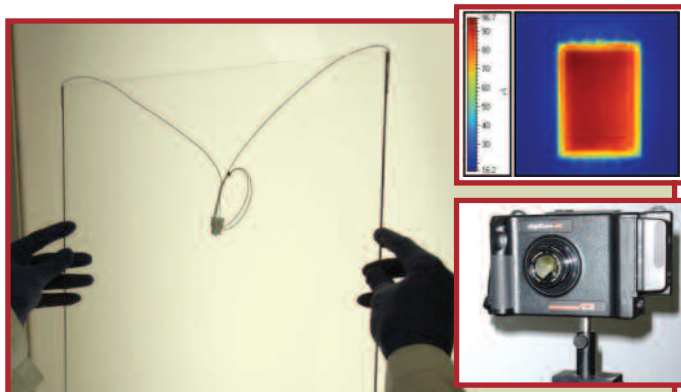
Conductive Ground Plane Termination – bus bar metals including silver, copper, nickel, gold and chrome. Chemistries / methods including ceramic frit, epoxy, polyester, acrylic and vacuum deposited.



NIGHT VISION COMPATIBILITY

Design Goal: Achieve night vision compatibility for applications including military air crew and ground-based missions, night driving or flying, night security and surveillance, wildlife observation, sleep lab monitoring, or search and rescue.

Dontech Solutions: Absorptive and reflective NVC filters designed to specific requirements (MIL-STD-3009, Class A, B and C, Type I Direct View Image night vision imaging system [NVIS] and Type II Projected Image NVIS) and system lighting (CCFL, LED, white and full color).



LOW TEMPERATURE OPERATION

Design Goal: Extend operating temperature of display. Prevent or remove fogging or icing and/or prevent sluggish liquid crystal function or crystallization.

Dontech Solutions: Therma Klear™ transparent heaters capable of extending operation to below -40°C.

Photo: Courtesy of DOD



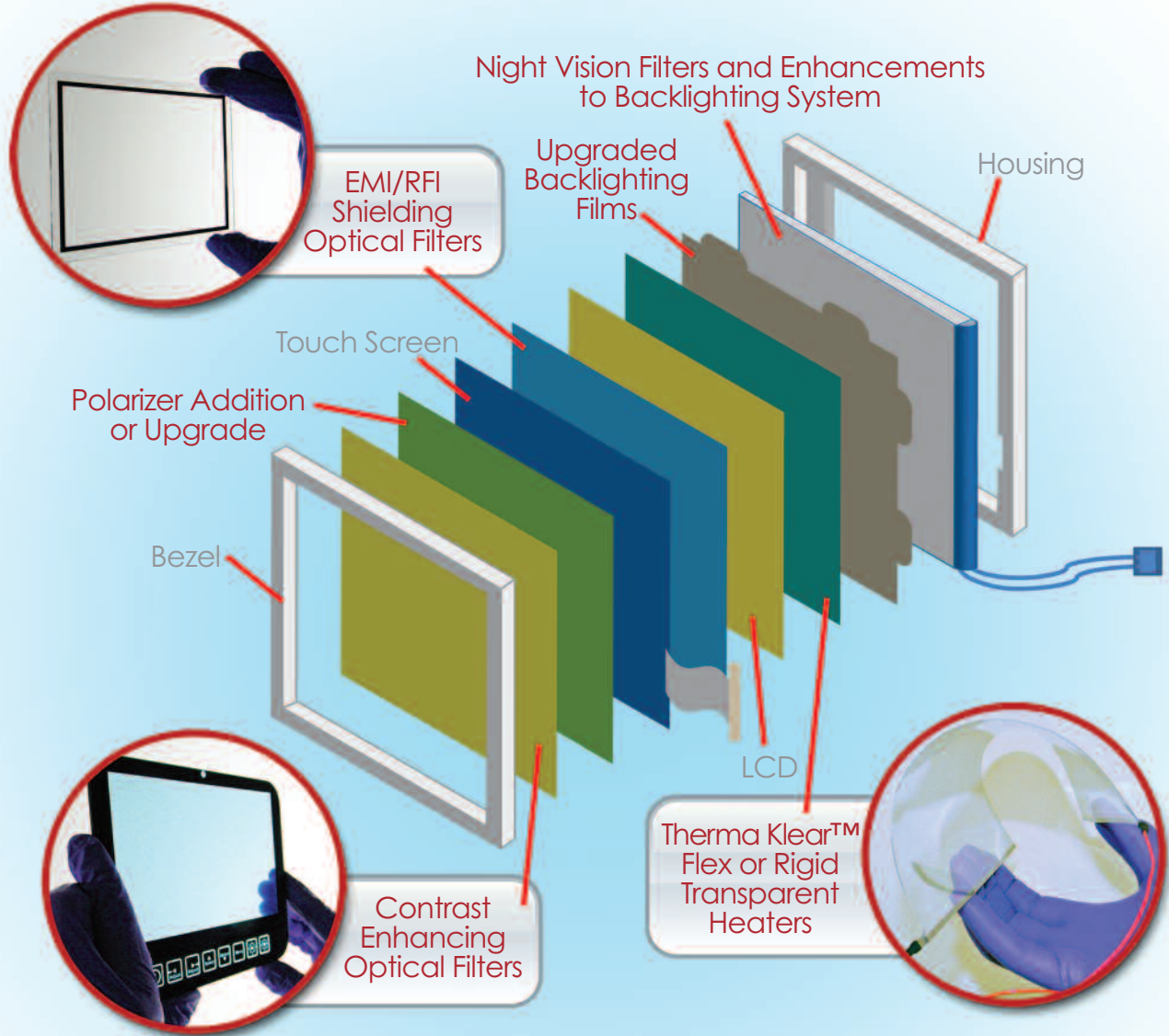
SOLAR LOAD REDUCTION/HEAT SHIELDING

Design Goal: Minimize excessive thermal loading on an LCD which can render it unreadable until it cools.

Dontech Solutions: Heat Shield™ filters – thin film coated optical substrates that transmit visible light while reflecting infrared (IR) and near-infrared (NIR) wavelengths.

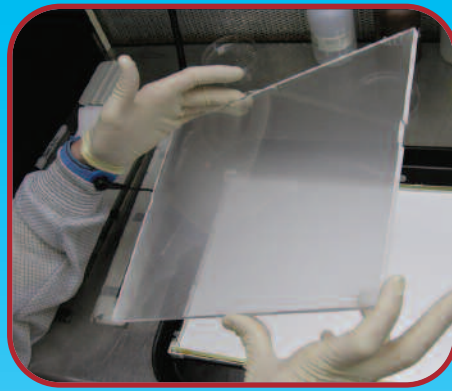
DONTECH ENHANCED DISPLAY SOLUTIONS (EDS)

Dontech, Inc. Enhanced Display Solutions (EDS) is a customizable display product technology that improves the performance (e.g., optical, operating thermal range, EMC, NVC, and mechanical durability) of electronic displays (e.g., LCDs), enabling displays to function properly in a variety of demanding environments. Typical markets include military, medical, electronic test equipment, and industrial electronics. Commercial off-the-shelf (COTS) displays are improved to meet the customer's specific requirements using a combination of Dontech-manufactured optical components. Enhancements can be coupled with any or all of the customized display filters, resulting in a fully integrated solution. Dontech EDS services offer solutions ranging from simple to very complex, depending on customer requirements.



DONTECH EDS – CAPABILITIES SUMMARY

Design Input / Requirement	High Ambient Light Viewability	EMI/RFI Compliance	Low Temperature Operation	Display Ruggedization & NVIS Upgrade	Heat/Thermal Protection
Antireflective Coatings and VARGard™ Films	X				
Contrast Enhancement Filters	X				
Conductive Meshes and Coatings		X			
Heat Shield™ Heat Reflector					X
Optical Bonding & Lamination	X	X	X	X	
Therma Klear™ Transparent Heaters			X	X	
Backlight Enhancing Films	X				
LED Upgrades	X			X	
Absorptive or Hot Mirror Filters				X	



MANUFACTURING FACILITY AND CAPABILITIES

Dontech's vertically integrated manufacturing facility includes class 10,000 and 1,000 ESD, humidity, and temperature controlled clean rooms, optical coating laboratories (vacuum deposited thin film and thick film hard coatings), machine shop, screen printing, optical laminating and bonding, and testing facilities.

Dontech offers customer-focused turnkey project and supply chain management for integrated display programs including display design, component sourcing, fabrication of optical components, inventory, assembly, and testing. Working within system and design constraints, Dontech can meet or exceed customer design goals for both legacy programs and innovative design applications.



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