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AG DISPLAYS
Advanced LCD Solutions Specialist

AEROSPACE SOLUTIONS

PART 145 REPAIR STATION
EMI SHIELDING
LED INTEGRATION

About Us

For over a decade AGDisplays has been a leading provider of high quality LCD enhancement products and services for the industrial markets. We lead the way in offering an extensive range of custom panel solutions that improve standard display attributes while maximizing performance in any environment. The AGDisplays teams are experts in LCDs, from building simple or complex designs to integration work including ruggedization.

In our 124,000 sq. foot facility, we offer over 800 off the shelf products that include tablets, open and closed frame LCDs and much more. Our knowledge in innovative LCD technology and our high-quality control standards separate us from the rest. At AGDisplays, our teams have a true commitment to becoming your trusted partner.

OUR SERVICES

- Off The Shelf LCD Products
- NVIS Integration and Design
- OCA, Optical & Bonding Services
- Custom LED Integration & Design
- Touch Screen Integration & Design
- Custom Glass Supply Services
- Turnkey & Design Services
- EMI Shielding & Design
- Film Enhancements & Repolarization
- Certificated FAA Part 145 Repair Station
- Component Assembly & Integration
- LCD Controller, Cabling & Design
- Testing/Certification of EOL Panels
- Drop-in Replacement
- Industrial Repair Program
- Zero Dead Pixel Inspection

Industries Served

MILITARY

AVIONICS

HOTEL

MARINE

MARKETING

MEDICAL

RESTAURANT

RETAIL

TRANSPORTATION

Aerospace

We serve the Aerospace industry by offering a full line of ruggedized display solutions. Created to meet military standards, ACDisplays provides ruggedized and night vision compatible solutions to perform in the harshest environments.

We can adapt your existing units to meet or exceed advanced LCD technology. Custom designs include adjustments in electrical/hardware changes, such as backlight functionality and NVC compatibility. Optical designs are enhanced by integrating films to adjust brightness, contrast and picture quality.

All design solutions are dependent on individual applications and lead to a completely unique technical solution to fulfill customer requirements.

Our team can help you acquire new, EOL or refurbished LCDs, and can customize virtually any panel to meet your specific requirements. From a simple spec enhancement to full solution kitting, ACDisplays handles LCD sourcing, logistics, assembly and repair—all in one place.

FAA §145 REPAIR STATION

"ACDisplays holds a Part 145 Limited Airframe, Limited Accessory rating."

NVIS DESIGNS

Dual mode high & low LED backlight; passive full front solution.

BONDING DESIGNS

Full range of custom OCA, optical or tape bonding for rugged enhancements.

GLASS SUPPLY

Optical clarity, display strength with integrated coverglass & custom screen-print designs.

EMI SHIELDING & DESIGN

Block electronic interference between LCDs & surrounding equipment with EMI solutions.

FILM ENHANCEMENTS

Increase LCD functionality, versatility & performance. Retrofits into any sized LCD.

ASSEMBLY & INTEGRATION

LCD solutions are custom designed to your needs. We source parts & integrate your design in our US-based facility.

LED INTEGRATION

Retrofit advanced LEDs for sunlight readability and low power usage.

INDUSTRIAL REPAIRS

Reduce costs by repairing LCD components with full outgoing diagnostic analyses on all units.

List of Products

RUGGED MOBILE

These devices meet military standards for shock & vibration, limited water submersion and dust ingression.

TABLETS

AGDisplays makes commercial off the shelf tablets easy to purchase with flexible spec options and easy purchasing.

TOUCH DISPLAYS

Our touch panels are eligible for performance upgrades like ruggedization, optical bonds and EMI protection.

LCD DISPLAYS

Our LCD design solutions maximize standard LCD performance in any environment.

MEDICAL DISPLAYS

Our LCDs support medical applications with long life cycles, high bright display readability and sharp contrast.

MARINE DISPLAYS

Marine displays can be IP rated and are designed specifically for use in all marine/boating applications.

DIGITAL SIGNAGE

Digital signage offers fast on-sight installation and easy access for maintenance & repairs.

PANEL MOUNT DISPLAYS

Panel mount displays are designed for industrial environments and can be outfitted to meet specific requirements.

TOUCH TABLES

Hold meetings and communicate business messages with superior and sensitive touch table technology.

MULTIMEDIA KIOSKS

AGDisplays offers a wide range of multimedia kiosks to effectively reach your customer.

SPECIALTY DISPLAYS

Bring interaction, creativity and technology together with 3D displays, all in ones and interactive whiteboards.

VIDEO WALLS

With narrow bezels for a seamless feel, users are captivated by the media displayed on our video walls.

§ 145 Repair Station

ACDisplays, in compliance with the requirements of the Code of Federal Regulations Title 14 Part 145 Repair Station, holds a Part 145 Limited Airframe, Limited Accessories rating.

Replacing in-flight entertainment TFT-LCDs costs companies thousands of dollars. Even the smallest blemish or scratch can prompt an LCD replacement. With ACDisplays' services, you can bypass the expensive LCD unit replacement and take advantage of our TFT-LCD repairs. Repairing, instead of replacing, decreases extra expenses and increases panel longevity.

ACDisplays corrects scratches by providing top and bottom glass polarizer repair for in-flight entertainment LCDs. A polarizer is a thin film on the top or bottom surface of the TFT-LCD that can be replaced using ACDisplays' approved process specifications. Our experts perform LCD repolarization in one of the multiple Class 1000 clean rooms that are located in our facility.

We achieve low fallout percentages by training technicians to exceptional standard.

ACDisplays maintains a technical library with OEM specifications, traceability documents and other technical information. The repair station properly documents, controls, and stores all applicable paperwork that accompanies services performed on articles for return to service. All repair station personnel are required to be familiar with the requirements of the repair station manual and all applicable FAA regulations. Our repair station personnel must follow the repair station quality control system when performing maintenance on articles being returned to service. Our FAA Part 145 Repair Station performs multiple inspections throughout the various stages of the maintenance process.

The ACDisplays facility performs maintenance and repairs to in-flight LCD panels in our facility in accordance with contract requirements. We employ Part 65 certified repairmen trained to inspect, repair, and approve airworthy LCD panels within the Repair Station's rating. Each Repair Station position in the repair station is evaluated on a regular basis to determine that the position is in compliance with CFR parts 43, 65, 91, and 145. Employees are subject to initial, recurrent and specialized training for the benefit of quality, safety and standards.

Night Vision

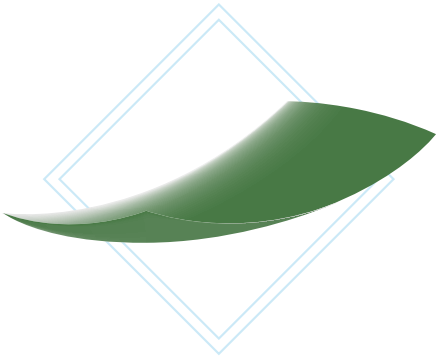
We offer two customizable NVIS solutions for TFT-LCDs. Whether you need to be compliant with MIL-STD-3009, or merely compatible with NVG equipment, we offer solutions tailored to accommodate your requirements and your existing LCD unit.

Our dual mode backlighting solution integrates both high bright and class A or B light filters into the panel, providing the option of using the panel in daylight mode, then in night mode with the flip of a switch. Daylight readability is increased with the installation of our Generation 4 high bright LEDs, while night mode is ideal for use with night vision goggles.

We also offer an NVIS filtering material for devices not requiring an active enhancement.

DUAL MODE BACKLIGHTING

Our dual mode solution is for day and night time use; integrated with high bright LEDs and ambient MIL-STD-3009 colors.



FULL FRONT NVIS

A front film filter for devices not requiring a robust or active NVIS solution. Easy to install and quick to remove.

Dual Mode Backlight

AGDisplays designs, develops and manufactures custom Dual Mode Backlighting Solutions for LCDs. The solution is designed to allow excellent readability in high ambient lighting, while also providing a secondary mode in which the panel's illumination is NVIS compliant. We can accommodate any sized display for the dual mode solution.

Integrating AGDisplays' Dual Mode Backlighting System into your panel has exclusive benefits: increased lifespan, lower power consumption, and versatility. Our Dual Mode Backlighting System consists of two backlight sources that operate independently of each other. The first light source is bundled; the second light source is an NVIS compliant light source that can have Class A or B filters. All optical components fall within military standards.

BENEFITS

- Switch from normal to NVIS mode and operate independently as needed
- High bright edge lit LED integration
- Compliance to MIL-STD-3009
- Various optical coatings available, such as AG/AR
- Glass protection from abrasion and spills
- Class A&B filtering options
- Optical bonding

With the installation of our Generation 4 high bright LEDs, panel readability and clarity in ambient light is maximized, as well as enhancing sunlight readability. In night mode, brightness is dropped, and light is filtered to allow compatibility with night vision imaging systems.

AGDisplays' LED backlights are made of durable material, which offer anywhere from 10,000 to 100,000 hours in operation life. The secondary backlight consumes less than one watt of power. The NVIS backlight remains unaffected by extremes in humidity (0% to 100%) and in temperatures ranging from -40° C to 85° C.

The dual mode NVIS compliant backlights are thin, typically 0.068 inches thick (1.7 mm) and can be constructed even thinner if need be. Furthermore, our NVIS-compliant dual mode backlight provides enhanced unit life and reliability, plus a dimming capability ranging from full brightness to zero nits.

Full Front NVIS

AGDisplays offers an NVIS filtering material for devices not requiring an active enhancement. Our polymeric material has been integrated and deployed in numerous military applications and is compliant with MIL-STD-3009 standards.

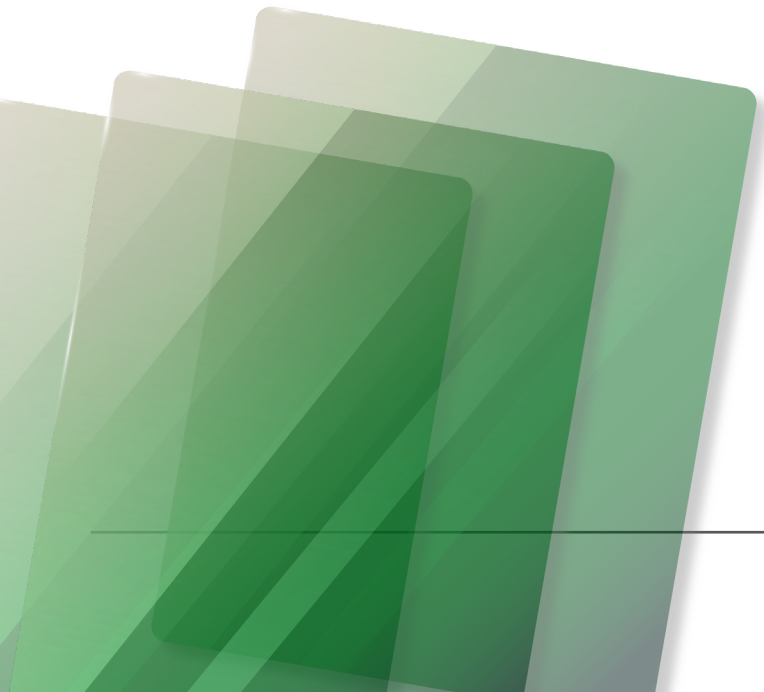
This solution provides an impressive level of absorption in the near-infrared and stability under solar and temperature exposure, with minimal impact to the visible spectrum. This solution offers a passive installation with safe removal.

EASY INSTALL

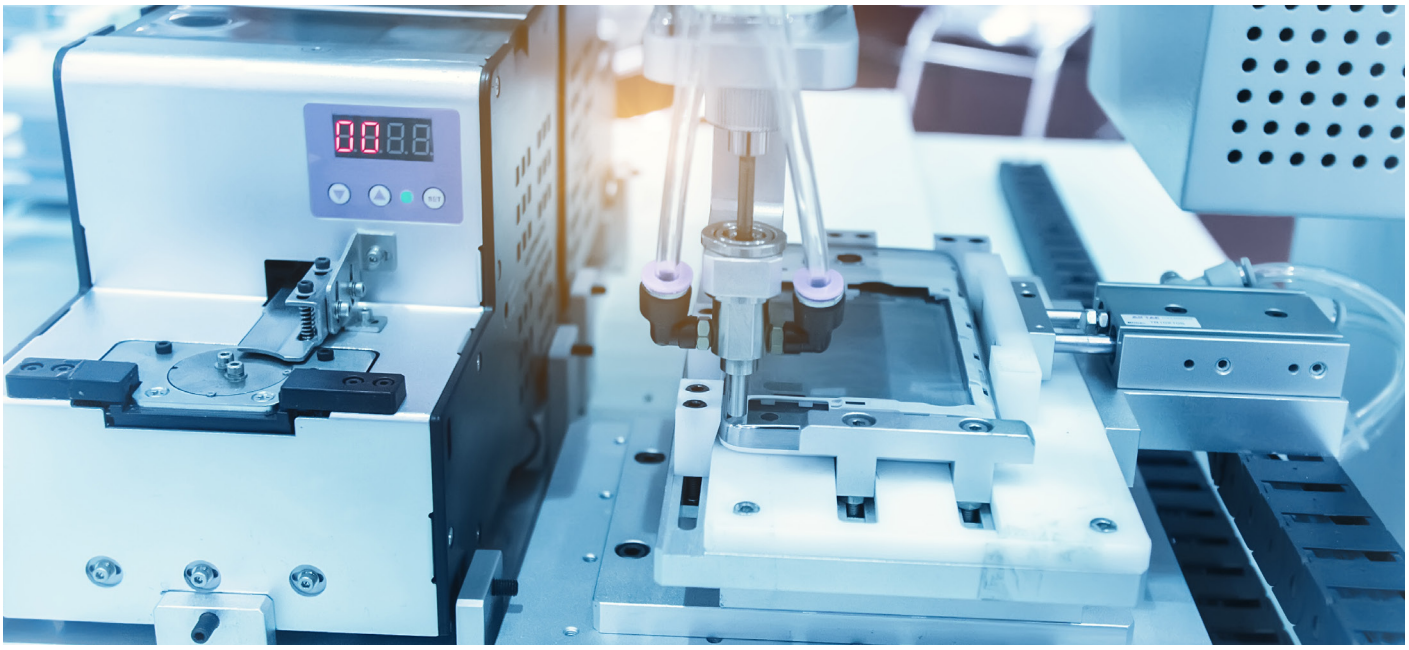
Quick to install and easy to remove, AGDisplays provides a passive enhancement that will not cause lasting damage to your unit and is easily removable when no longer needed.

BENEFITS

- Unique polymeric material designed for optical performance
- Specifically designed to work with LED light
- High visible transmission, low radiance
- Available in all MIL-STD-3009 colors
- Range of thicknesses available
- Passive installation
- Safe removal



Bonding



AGDisplays offers three different methods of bonding for your LCD to add strength and clarity, as well as using it as an integration method when incorporating one of our other value add services. In performing a bonding procedure on your LCD, your display will be more rugged and less prone to environmental vulnerabilities such as dust collection and moisture condensation.

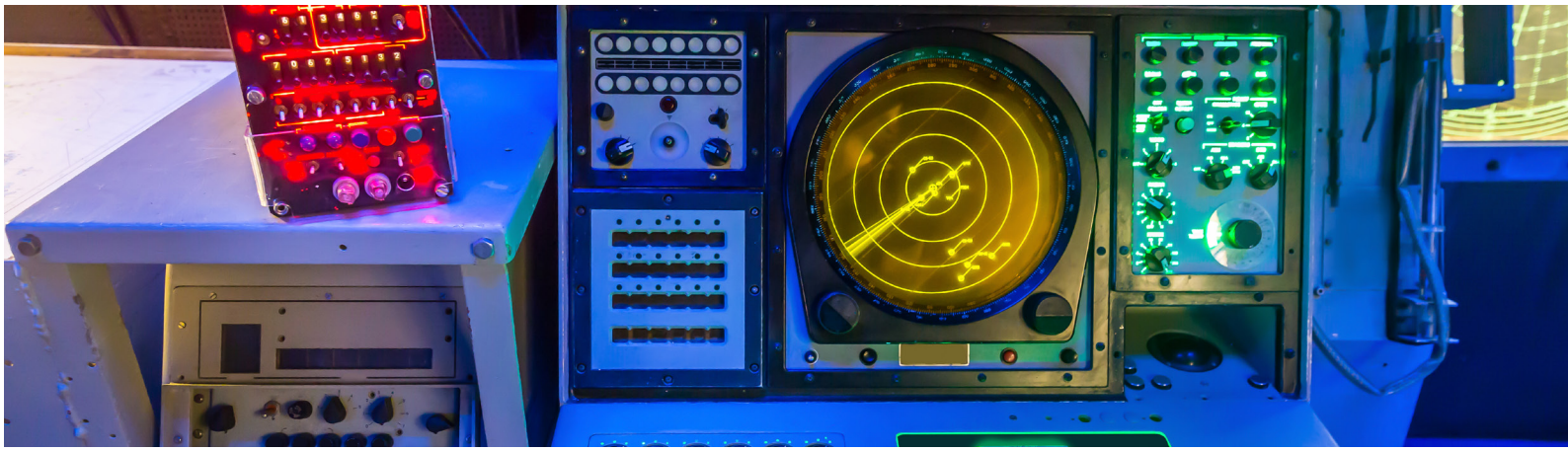
Often, LCD designs that add hardware to the LCD, such as touchscreens or front cover glass, are constructed in such a fashion that air gaps are left in between the layers of its components. Internal reflections are created by these air gap created between these layers. Gaps create internal reflections, and internal reflections decrease optical clarity as well as leave the LCD vulnerable to contamination.

Applying a bond solves much of the refraction and other vulnerabilities mentioned, depending on the application requirements.

Optical clarity and readability may also increase because of the refractive layers being decreased. The lower the refractive surfaces, the increase in clarity and transmission.

Bonding methods are performed in one of AGDisplays' Class 1000 clean rooms. A clean room is used across various industries where tiny contamination particles may be susceptible for intrusion in the manufacturing process. A clean room is a controlled environment that is specifically designed to keep levels of air pollutants very low. AGDisplays performs all critical manufacturing processes in clean rooms, including our bonding services.

OCA Bonding



Displays and touch panels are at their best when they perform with highly transparent, low-haze, and UV resistant features. Adding an optically clear adhesive to your LCD's stack up promotes these features.

OCA bonding is considered a safe and effective alternative to costly liquid optical bonding. There are various advantages to choosing OCA bonding as your preferred integration method. Like liquid bond, OCA reduces the reflection layers in a panel. OCA bonding is clean, which eliminates the need to clean up residuals after the bonding process is complete. The process produces high yield and is repairable.

SUBSTRATES	OCA PRODUCT SIZE CAPABILITY
LCD	1"-12" (typ) diagonal max
Touch Screens	1"-12" (typ) diagonal max
Mobile Devices	Samsung Galaxy S4, S5, Note 3, Note 4, Apple iPhone 6,6+
Glass, Polycarbonate, Transparent Materials, Acrylic	9"x13" max/15" diagonal size
Optical Lenses	9" max diameter

BENEFITS

- Increased readability and brightness.
- Strengthened Durability
- High Adhesion
- UV Protection
- Bare ITO Compatible
- Whitening and Yellowing Resistant
- Removes moisture/condensation and debris to increase viewability
- OCA strengthens structural stability to outstand rough environments.
- OCA creates a single optical layer, reducing glare and increasing optical clarity.

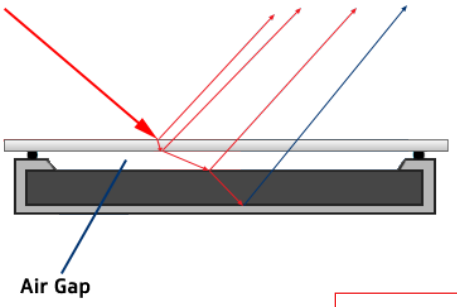
Optical Bonding

ACDisplays offers optical bonding for panel sizes as large as 21.5 inches. This robust solution may involve a full lamination, consisting of two outer substrates sandwiching layers of adhesives and other elements. The solution creates superior LCD strength, prevents a screen shatters and is less vulnerable to contamination & moisture. It also provides extended operational temperature range and increases touch response. Substrates available are glass, polycarbonate and acrylic. Laminated applications can include: EMI shielding, privacy filters, enhancement filters and security screens.

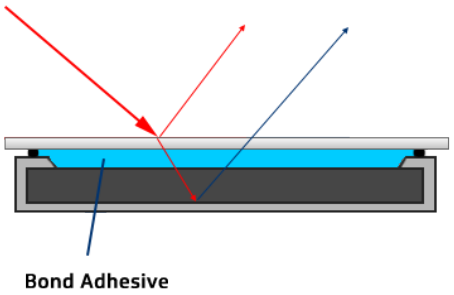
Optical bonding increases quality and lifespan of an LCD, keeping overall replacement costs low. Although our optical bonding service is the strongest bonding service we provide, the solution is reworkable through our production process. ACDisplays performs quality assurance measures and testing on each LCD to ensure specifications are met. Our facility is capable of performing low and high volume production.

BENEFITS

- Optical performance: increased luminance & contrast, reduced internal reflections
- Ruggedization: superior LCD strength and prevents shattered screens
- Reworkable through production process
- Halogen-free: low toxicity, environmentally-friendly materials
- Excellent UV resistance
- Extended operating temperature range

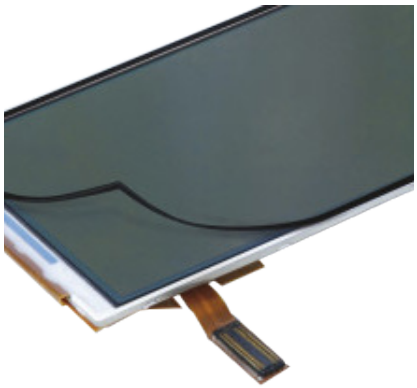


BEFORE



AFTER

Tape Bonding



When optical bonding is not practical for your LCD, AGDisplays offers tape, or perimeter, bonding. Perimeter bonding helps your company save on costs while still sufficiently ruggedizing your panels. Our tape bond services provide a secure bond that increases LCD flexibility, long-term durability and improved appearance. The adhesive offers a wide temperature specification, allowing a durable integration method in various environments.

Our technical experts manually perform each bond with precision inside a class 1000 clean room. AGDisplays supports virtually any manufacturer of LCD and touchscreen. For cover glass shield protection, AGDisplays can work with your requirements to offer products and glass materials to achieve your exact requirement. Consult AGDisplays today to speak with a representative about which option is best for your project.

BENEFITS

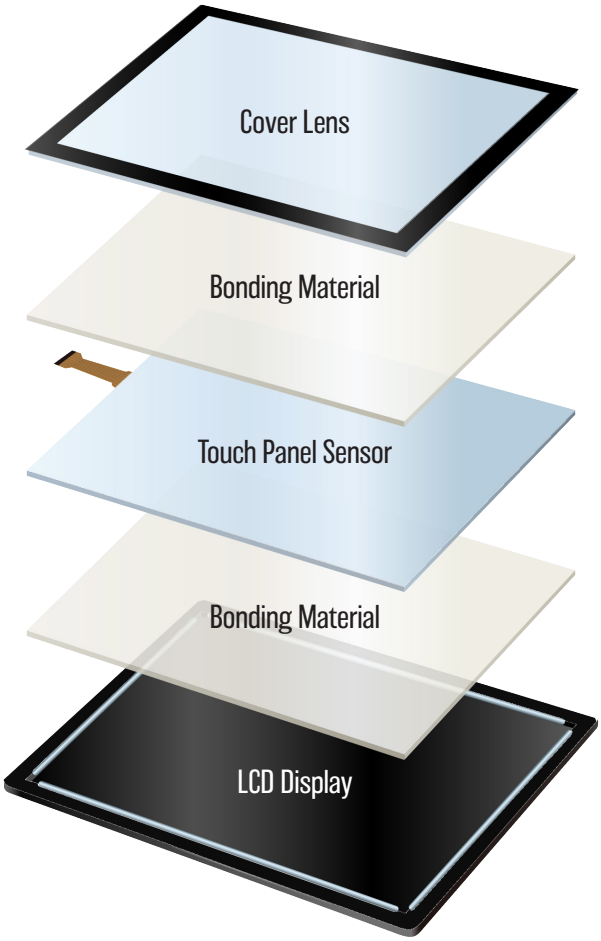
- Retrofitted to All LCDs
- Bond with High Adhesion
- Withstand Static or Dynamic Strength
- Continuous Bond Distributes Stress Over Entire Bond
- Viscoelastic
- Resistant to Extreme Weather
- Seal Against Environmental Conditions

Custom Glass

Display assemblies with integrated strengthened cover glass have become a popular solution in years past. Utilizing a glass substrate has the superior advantage of increased hardness and scratch resistance as well as having a higher design value.

Pairing glass with various strengthening methods increases the robustness even more. ACDisplays offers a variety of cover glass options to add durability and protection to an LCD. Each material substrate provides unique benefits. Glass options we offer include chemically strengthened soda lime: clear and tinted, grey glass, low iron, AG etched, low emissivity, heat absorbing float glass; AGC Dragontrail™; Corning® Gorilla® Glass.

ACDisplays integrates the cover glass displays using a process called bonding. We offer three different bond integration methods: optical bond, OCA bond, and tape bond. Service options are available based on the size and specifications of your project.



BENEFITS

- Chemically-Strengthened
- Scratch and Crack Resistant
- Improved Surface Quality
- Enhanced Response
- Thin and Light without Fragility
- Promote Sunlight Readability
- Ruggedized
- Protection From EMI Interference

Custom Glass

CAPABILITIES

CUTTING

- Water jet: max material size 90”x46”, min material size 2”x2”
- Scribe cutting: excalibur, bystronic, TLC, handcutting, precision XY sawing

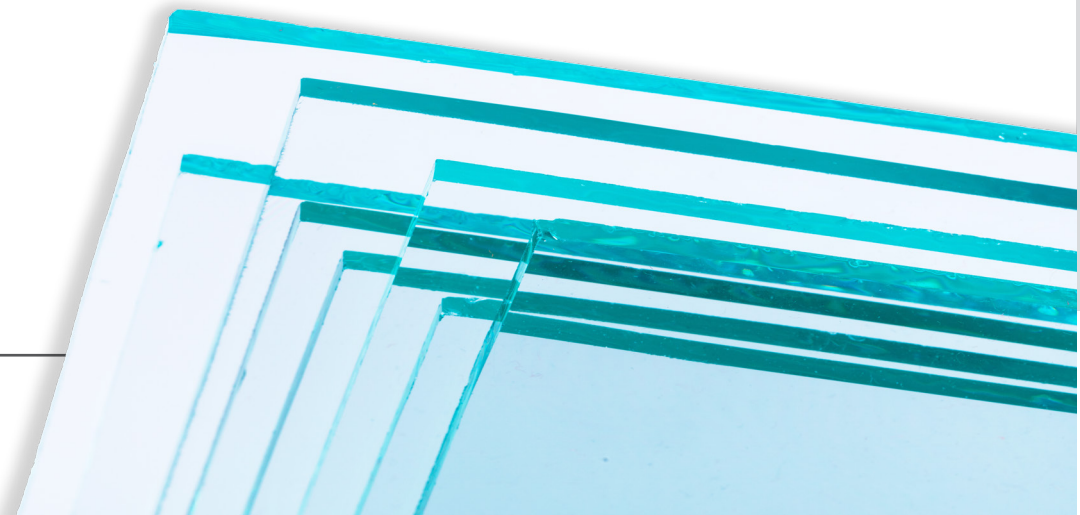
SCREEN PRINTING

- Ekra X4, Argon - Large, Cameo/Saturn, Saturn, Custom Press
- Ink types: epoxy/polyester, frit
- Etching & bus bars: Ekra X4, Cameo 18, Cameo 30, Saturn
- Edge printing

EDGING

- Angled and multilevel bevels, seams, corner dubbing, circle & flat ground, pencil & polished
- Edge types: flat ground, flat polish, flat polish with arris, pencil ground, pencil polished, safety seamed, dubbed corners, stepped and route surfaces, beveled edges, bullnose edges (half & full)

EDGING



Custom Glass

CHEMICAL STRENGTHENING

STANDARD SODA LIME

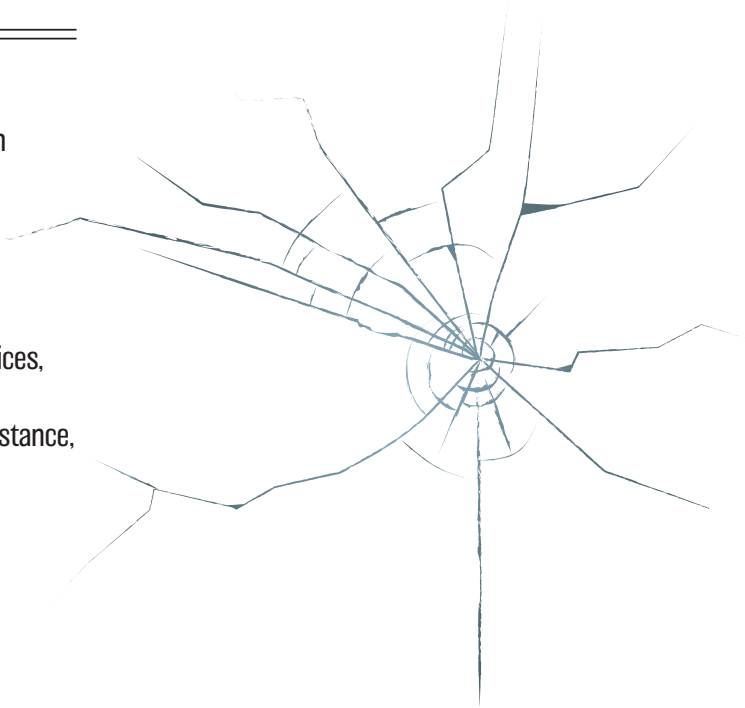
- Soda lime is toughened through a sodium and potassium ion exchange. Often requested for thin display applications
- Thickness: min .30 mm - max 19 mm

HIE GLASS

- 6-8x stronger than float glass.
- Typically used for electronic displays like tablets, mobile devices, touchscreens.
- Improves impact resistance, flexibility strength, scratch resistance, resistance to temp changes.

HEAT TEMPERING (ASTM C-1048-04)

- Heat strengthening
- Safety tempering (dices when broken)



POPULAR OPTIONS

AGC Dragontrail™ is a chemically strengthened and tempered float-glass material that is 6x more durable than soda lime glass. With this strength, the glass can be produced in thinner material.

Vicker's Hardness	
Unstrengthened	596 kg f/mm²
Strengthened	673 kg f/mm²
Thickness Availability	
Standard	0.8 to 1.1 mm
Special Request (MOQ req.)	0.5 to 5.0 mm

Corning® Gorilla® Glass is a thin sheet glass with a high degree of chemical strengthening. Benefits of Gorilla® Glass include high scratch resistance, high retained strength after use, and pristine surface quality.

Vicker's Hardness	
Unstrengthened	534 kg f/mm²
Strengthened	649 kg f/mm²
Thickness Availability	0.4 mm to 2.0 mm

EMI Shielding

EMI film provides the "immunity" for electronic components that are susceptible to EMI (electromagnetic interference). Our solution options offer maximized optical performance and makes display/touch screen RFI compliant.

EMI film or mesh solutions integrate quick and easy, requiring no redesign and allowing for fast production. Our service installs new EMI shielding, or replaces existing EMI system. While our transparent film and mesh solutions are our most popular solutions, ACDisplays also offers other EMI options to meet your design requirements.

Transparent thin-film conductive coatings provide LCD technology with great optical and EMI shielding properties. Typically the frequency level ranges in 100 kHz - 20 GHz. Films may be offered with conductivity ranging from 1 to 100 Ω/sq.

Conductive grid mesh solutions provide panels with a high level of protection. A fine-conductive grid may be built of woven stainless-steel or copper mesh, or alternatively made with a patterned conductive metal coating on the substrate's surface.

EMI MESH SOLUTIONS

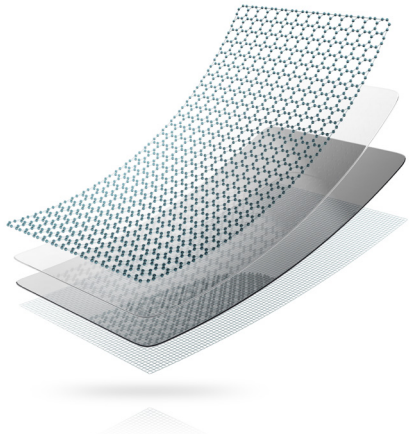
- Woven wire mesh
- Robust active enhancement, providing high level of protection
- Compatible for use with a touch sensor
- Photopic transmission at ≥85%
- Diffuse reflectance at 30˚ at ≤0.14%
- Specular reflectance at 30˚ at ≤1.2%
- ≤0.25 Ω/sq. surface resistance
- Shielding effectiveness:
  - 50 Mhz (megahertz): ~75 dB
  - 100 Mhz: ~65 dB

EMI FILM SOLUTIONS

- For panels needing low attenuation (10-20 dB)
- Cost effective solution, passive enhancement
- Compatible for use with a touch sensor
- High visible transmission with low electrical resistance:
  - 10 ohms/sq.
  - 20 ohms/sq.
- Reduces problematic EMI and/or IR emissions from surface
- Superior to ITO films at low resistance for transparency & mechanical properties

BENEFITS

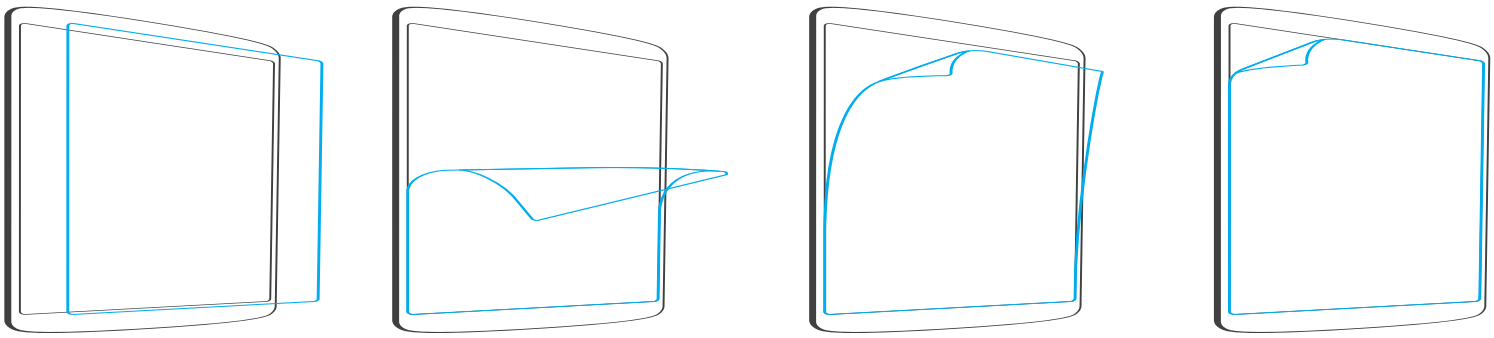
- Passive Integration Solution
- Compatible with Touch Sensors
- High Visible Transmission
- Reduces EMI/IR Surface Emissions
- Superior to ITO Films
- Several Custom Design Options



Film Solutions

Increase brightness, eliminate reflection and glare, prevent EMI interference, add privacy features and more, just by integrating a film enhancement to your LCD configuration. LCDs purchased off the shelf are likely not properly built for extreme and industrial conditions, so ACDisplays offers quick and easy LCD solutions to achieve readability and clarity levels without having to upgrade to new and expensive LCD technology.

Film enhancements working with LED backlight sources and ambient light to optimize light refraction for enhanced clarity and image quality. Our film products are easily integrated into your current LCD, and may be retrofitted into any sized solution. This service is a passive enhancement, meaning there is no change in neither electrical components nor additional wattage consumption.



Since film enhancement is non-evasive, power consumption remains the same, and there is no concern to readjust thermal management.

Our most popular high bright solution can increase brightness by 40-140% and intensify color contrast, optics, brightness and overall image quality. Brightness increase doesn't increase LCD power consumption. So, how does it work? While one film refracts light towards the viewer, a second film reflects the light back into the LCD, essentially recycling the light until it exits the LCD.

Due to the limitless variations in LCD specifications, ACDisplays builds film enhancement per customer project so that we can guarantee a optimized design specifically for your panel.

BENEFITS

- Up to 140% increase in brightness without increase in power consumption
- Increased display contrast and readability
- Enhanced optics and image clarity
- Increased side-viewability
- Front glass protection
- Resistance to scratches and contaminants
- Increased color sharpness
- Privacy of information

Film Solutions

ANTI-GLARE

Anti-glare (AG) treatments minimize reflections from ambient lighting, noticeably improving readability. AG applied to glass and other substrates reduces surface reflection. The textured film diffuses specular reflections, removing the external reflection a user may experience. This film also improves scratch resistance. AG gives a matte appearance on the front of the LCD.

ANTI-REFLECTIVE

Anti-reflective (AR) film improves the durability and lifetime of your display surface. Anti-reflective properties increase the contrast and sharpness as well as decrease the reflection from your LCD screen without having to increase your LCD's power consumption. Anti-reflective film can be identified as having a slightly purple tint.

BEF

Brightness Enhancement Film or BEF film can increase the brightness of LCDs through utilizing refraction and reflection, increasing the efficiency of your backlight source. Light exits the LCD at a specific angle; light outside of this angle is reflected back into the LCD until it exits at the proper angle. Multiple BEF films used in unison can enhance light properties.

DBEF

Dual Brightness Enhancement Film (DBEF) is another thin film reflective polarizer that enhances LCD brightness. It uses light normally lost to absorption in the bottom LCD polarizer and redirects it until allowing it to exit the LCD backlight assembly. Using DBEF film in conjunction with BEF film can often offer the highest yield of light output.

Film Solutions

ESR

Enhanced Specular Reflector (ESR) is designed to maximize the usage and distribution of light from the LCD's light source. ESR film allows light distribution from the backlight to increase the LCD's viewing angle. This film used with other brightness enhancing films can obtain the highest light output. Good solution for LCDs used in direct sunlight light.

PRIVACY FILMS

ACDisplays' privacy film solution decreases viewing angles, allowing an increase in privacy by keeping information away from prying eyes. It works by controlling the distribution of light in relation to the viewing angle of the display. Light control films direct light only in the direction of the user; viewed from the front, the display is clear and bright. Viewed from either the left or right side, the display view is black.

LIGHT DIFFUSION

Diffusion films improve LCD functionality by providing brightness uniformity throughout the active area. Light travelling through the stack up of an LCD will have no inherent direction and will be travelling in all directions. The function of the diffuser film is to redirect light in one direction, toward the next film. Employing diffuser films can provide up to 98% total light transmittance.

QUARTER WAVE RETARDER

This film offers uniform birefringence, increasing the wide angle view performance of the panel while keeping haziness low. Birefringence refers to the double refraction of light seen through a transparent material. This film works to provide a uniform view of the images on the LCD when being viewed from the left, right, top or bottom.

Assembly & Integration

ACDisplays offers Component Assembly and Integration services to provide LCD display options and peripherals, custom-designed to your needs. Your design components are sourced by ACDisplays, and carefully integrated in our US-based facility, providing you a true one-stop-shop for LCD solutions.

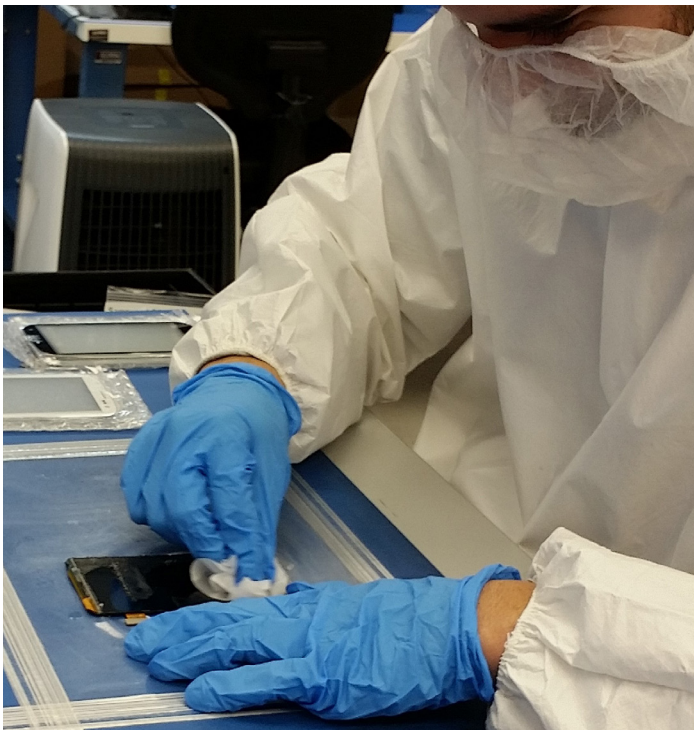
ACDisplays offers a wide selection of TFT-LCD displays and touch sensors. We source and support virtually all components such as controller boards, LED lighting systems and touchscreen sensors. If needed, value adds and custom solutions are available for upgrades.

By assembling LCD solutions in house, our US-based location lends itself to high flexibility in the production and manufacturing environment, helping us meet ever-changing specifications and deadlines.

If your design is already complete, ACDisplays will source and integrate components according to your specifications. Using our multiple layered procurement strategies, ACDisplays may source your components for cost-reduction, all while holding quality standards as priority.

BENEFITS

- **One point of customer support for order modifications or concerns that may arise.**
- **Full customization of display and performance features, including additional enhancements.**
- **Ordering process is simplified to only one point of contact and one completed shipment.**
- **Consistent and thorough documentation system to ensure accuracy and traceability.**
- **If quality or supply is disrupted, we manage compatibility and ensure top quality parts.**

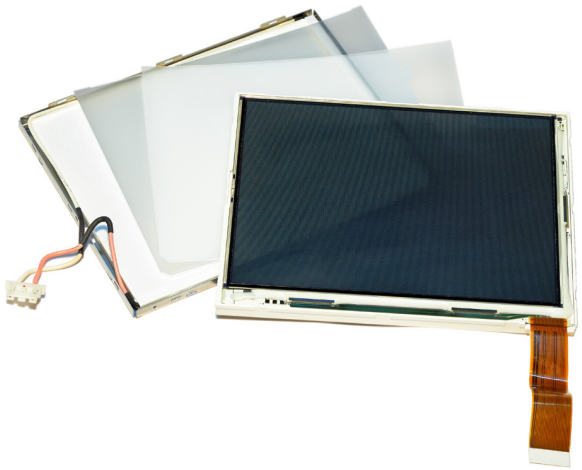


Assembly & Integration

ACDisplays offers two variations of our assembly and integration service: project assembly/integration and project kitting. While we provide a virtually unlimited supply and range of display and component products, ACDisplays also offers LCD enhancements that are aimed to increase durability and functionality of your LCD panel in its operational environment.

ASSEMBLY AND INTEGRATION

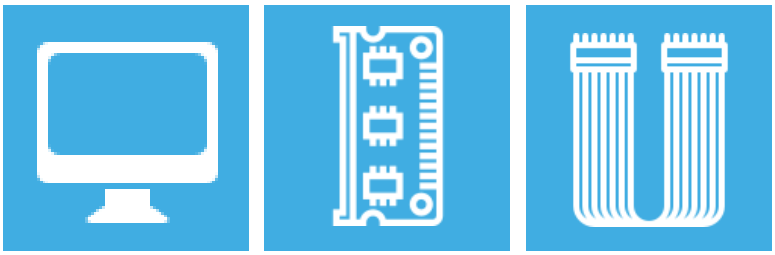
In a custom assembly build, components are added or modified to meet project specifications. An example of such an enhancement could be an added touch sensor, creating a touch-enabled LCD. The sensor would be integrated into the display component, and the customer would receive a completed project, the enhanced display with compatible touch controllers.



LCD KITTING

ACDisplays pairs and offers kits to customers so they can save on assembly costs. A kit may consist of a main display, a touch sensor, a controller, and cable sets.

Customers may order the kit according to a known or unknown LCD part number and the needs of their project.



High Bright Integration

ACDisplays provides LED backlight solutions that are customized to your requirements, with flexible brightness and design customization. We expertly utilize dynamic color mixing and color sequencing capabilities.

ACDisplays are considered pioneers in high bright LED technology. We carry our own line of High Bright LED rails that we continue to advance as the industry changes. We offer custom-sized LED backlight solutions that we design and tailor to custom-fit your exact needs.

The ACDisplays design team works expertly with your specifications to integrate LED designs without compromising quality and readability. Our dependable component selections make the LED backlights and controllers offered by ACDisplays some of the most reliable in the industry.

BENEFITS

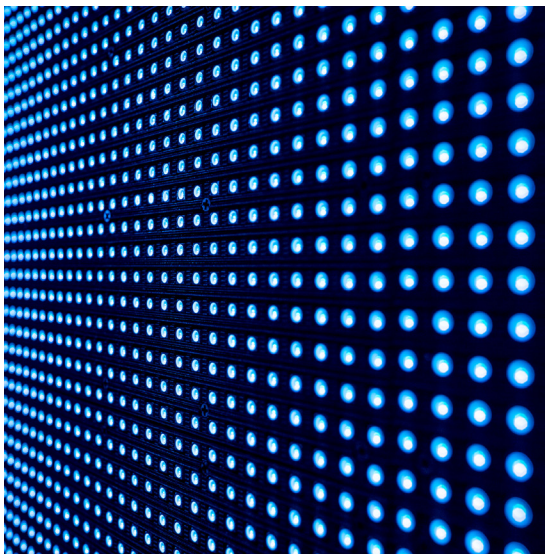
- High sunlight readability
- NVIS-compatible options
- High color gamut achievable
- Lower EMI output and better EMI resistance
- Improved shock and vibration
- Extended lifespan:10,000-100,000 hours
- Durable in extreme hot and frigid cold
- Protection against extreme humidity
- Low power consumption & high brightness output
- Environmentally safe: LEDs are ROHS-compliant, mercury- & lead-free, reduced EMI emissions
- Smaller LEDs for a slim and light design
- Custom-manufactured LED controllers

High Bright Integration

LED backlighting is typically designed as edge-lit or in a direct backlighting arrangement. Both designs have the LEDs concentrated into a diffuser source (light guide of the display) distributing the light uniformly throughout the viewing area.

EDGE-LIT BACKLIGHTING

With an edge-lit backlight design, LEDs are aligned along edge of the internal light guide of the LCD. The backlight array may be mounted on one, two, or all four edges, depending on the size of the display and the amount of luminance required. With this design, light from the LEDs is captured and spread across the viewing area by way of the light guide. Benefits of this design include a slimmer profile and lower cost of LEDs. This design is easily designed into any sized LCD, and is a great option for thin applications. AGDisplays uses our low footprint Generation 4 high bright LEDs in this and our direct backlight design.



DIRECT BACKLIGHTING

In a direct backlighting arrangement, LEDs are placed in a flat array behind the light guide and the diffuser plate. Direct backlighting works as a uniform source of light, like most CCFLs. One of the pros of integrating a direct backlight arrangement is that it allows for local-dimming, which means the display is able to dim specific areas to create vivid images, drastically increase the apparent contrast ratio, provide precise color adjustment and enhance overall viewing quality. Blacks are true black and grays are more defined.

Industrial Repair

ACDisplays repairs most components on an LCD, so our customers don't have to replace whole units for minor repairs. Over years of finely-tuning our in-house manufacturing processes, we provide a smooth transition from modification, to inspection, to shipping. All repairs are performed at our US-based headquarters in Greensburg, PA.

ACDisplays is focused on refurbishing and repairing your LCDs; we specialize in providing cost-effective alternatives to LCD replacements. Located in Greensburg, Pennsylvania, our 124,000 square foot facility utilizes our multiple production lines and class 1,000+ clean rooms to perform precise modification and improvement procedures. For quality assurance measures, we perform a full diagnostic analysis for each repaired unit before sending restored LCDs back to customers.

With 40+ years of experience, ACDisplays trains our individuals through a stringent curriculum in which we evaluate regularly. If your unit has gone end of life (EOL), ACDisplays offers you access to our list of trusted LCD distributors. We also provide repair warranty services for panels that are no longer under OEM warranty.

BENEFITS

- **Access our line of trusted LCD distributors. Distributors are audited for quality assurance.**
- **Keep maintenance costs down without compromising quality of units.**
- **Access end of life (EOL) panels that are out of reach for others.**
- **Warranty program for products that are no longer under OEM warranty.**
- **Competitive and flexible pricing, including value add upgrades**
- **Full diagnostic analysis performed on each repaired unit**

Additional Expertise

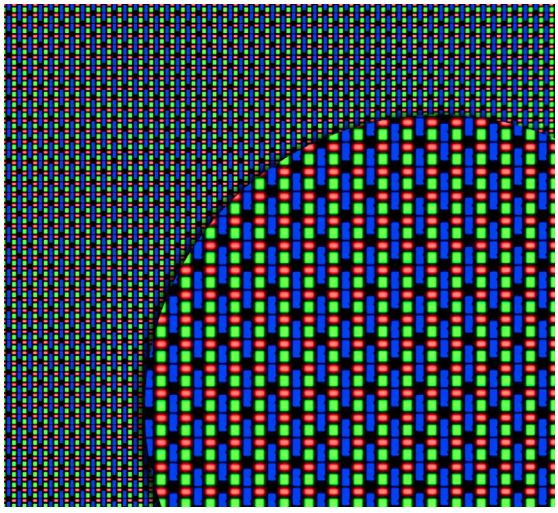
LIFECYCLE SUPPORT

AGDisplays works together with your teams to support your product's life from the conception to disposal. Implement an organized product lifecycle management program may be a challenge for companies who run into design and engineering challenges. We centralize the creation and management of all data and technology to support you in a succesful lifecycle management system. At the end of a product's lifecycle, we can provide EOL display and component alternatives to extend your product's lifespan.

DROP IN REPLACEMENT

AGDisplays offers a drop in replacement service for customers who need to replace an LCD or LCD component when their original part is EOL. This service is also for customers who are looking for a cost effective, suitable replacements/upgrades to their existing LCDs. AGDisplays offers availability of standard or custom high-quality LCDs of virtually all shapes and sizes.

By simply providing us with your panel part number, general specifications and any other upgrade requirements, we source these products for you or we can source an equivalent replacement. Using a replacement LCD does not compromise on quality and compatibility; we ensure functionality and performance are top priority.



ZERO PIXEL INSPECTION

Zero Pixel Inspection is for customers who have a zero fail pixel standard. Customers may send LCD panels from OEM directly to AGDisplays for inspection. We inspect for hot, stuck and dead pixels, as well as evaluate LCD quality standards. We confirm and document our findings for verification purposes.

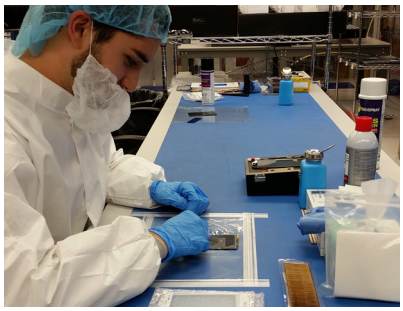
AGDisplays uses a meticulous objective visual verification process to ensure your quality standards are met and that LCD pixel defects are not present in your products. We receive panels from the OEM before they reach the customer and we verify that your zero-pixel specifications are being met. If the panel fails OEM specification grade, we perform an exchange for panels that are standard or above standard for your industry.

Thank You

COMMUNITY OF EXPERTS

Whether we are met with a new design or challenged with improving an existing design, AGDisplays supports your team by delivering unparalleled LCD expertise and technology. AGDisplays' partners benefit from our efficient design process and our dedication to creating quality design solutions.

We saw the need for off the shelf products, so we've added an expansive line of open/closed frame LCDs, digital signage, and all-in-one products. We offer unique LCD products like advanced touchscreen tabletops, high quality medical displays and rugged mobile devices. All of which can benefit from our value add integration services. Our products are used across many industries including Military, Avionics, Marine, Industrial, Medical, Transportation and many more.



CERTIFICATIONS

AGDisplays values high-quality working and design standards. We support your teams with the knowledge & expertise needed to make strategic design and manufacturing decisions.

CERTIFICATED PART 145
REPAIR STATION

AGDISPLAYS IS
ISO 14001, 45001 & R2
CERTIFIED

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