CDS
Crystal Display Systems Ltd

OPTICAL BONDING

LucidBond™

Affix cover lens to display for enhanced optical performance and improved vandal resistance

ArmorBond™

Affix cover lens to tempered glass for improved vandal resistance

Optical bonding solutions

Crystal Display Systems Ltd have increased their optical bonded capability by partnering with leading Optical Bonding (OB) specialist CiVUE Optotech

FEATURES AND BENEFITS OF OPTICAL BONDING INCLUDE

- Increased contrast and viewing angle
- Bonding of sizes up to 75”
- UV protection / UV Resistance
- Extended temperature
- Improved visual quality
- Fully re-workable
- No water condensation & contamination
- Better impact resistance
- Eliminate the wash-out effect
- Waterproof

MARINE | MILITARY | KIOSK | TRANSPORTATION | INDUSTRIAL HMI | MEDICAL






Crystal Display Systems Ltd
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LCDs Optimised for Optical Bonding

CDS Offer a wide range of high brightness sunlight readable panels that can be used by themselves or integrated with cover glass or touch panels using CiVUE's proprietary optical bonding technology suitable for use under direct sunlight or high ambient light conditions.

Size	Part number	Resolution	Brightness (cd/m2)	LED half time (hrs)	Operating temp	Interface	Features
5”	CIV-050-005-01-1	800 x 480	1000	50K	-20 ~ 70	TTL	
5.7”	CIV-057-004-02-1	640 x 480	1200	50K	-20 ~ 70	TTL	
5.7”	CIV-057-019-01-1	640 x 480	2200	50K	-20 ~ 70	LVDS	
7”	CIV-070-004-04-1	800 x 480	800	50K	-20 ~ 70	TTL	TMR
7”	CIV-070-010-02-1	800 x 480	1000	70K	-35 ~ 85	LVDS	
7”	CIV-070-010-03-1	800 x 480	1300	70K	-35 ~ 85	LVDS	
7”	CIV-070-031-01-1	800 x 480	2200	50K	-20 ~ 70	LVDS	
10.1”	CIV-101-016-02-1	1280 x 800	1000	70K	-20 ~ 70	LVDS	WV
10.4’	CIV-104-008-02-1	1024 x 768	1200	70K	-30 ~ 70	LVDS	WV
12.1”	CIV-121-024-02-1	1280 x 800	1200	70K	-30 ~ 80	LVDS	
12.1”	CIV-121-025-02-1	1280 x 800	1200	70K	-30 ~ 85	LVDS	WV
12.1”	CIV-121-026-02-1	800 x 600	1200	70K	-30 ~ 85	LVDS	WV
12.1”	CIV-121-029-02-1	1024 x 769	1000	70K	-30 ~ 85	LVDS	WV 2019/Q3 MP
12.8”	CIV-128-001-02-1	1920 x 1080	1000	50K	-30 ~ 85	LVDS	WV NEW
13.3”	CIV-133-004-02-1	1920 x 1080	1000	70K	0 ~ 70	LVDS	WV
15”	CIV-150-019-02-1	1024 x 768	1000	70K	-30 ~ 80	LVDS	WV 2019/Q3 MP
17”	CIV-170-006-02-1	1280 x 1024	1200	70K	-30 ~ 80	LVDS	
17.3”	CIV-173-001-02-1	1920 x 1080	1300	70K	0 ~ 70	LVDS	
18.5”	CIV-185-004-02-1	1920 x 1080	800	70K	-20 ~ 70	LVDS	WV
19”	CIV-190-013-02-1	1280 x 1024	1000	70K	-30 ~ 85	LVDS	very low power consumption
21.5”	CIV-215-007-02-1	1920 x 1080	800	70K	0 ~ 50	LVDS	WV
24”	CIV-150-019-02-1	1920 x 1080	1000	70K	-20 ~ 70	LVDS	WV
27”	CIV-150-019-02-1	1920 x 1080	800	70K	0 ~ 50	LVDS	WV
27”	CIV-150-019-02-1	1920 x 1080	600	70K	0 ~ 50	LVDS	WV

TMR – Transmissive Reflective | WV – Wide View

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What is Optical Bonding?

With CiVUE's proprietary materials and a unique re-workable process, CDS provide solutions that enhance sunlight readability and provide additional ruggedness / vandal resistance.

Almost every OB solution requires a detailed project management approach to ensure that all aspects of the design are taken into consideration and to maximise the benefits of the technology.

The operation of TFT LCD monitors in an "outside" environment has always given a number of challenges. The main one being high ambient light washout which dramatically affects the viewability due to the effect of a reduction in contrast. This is due to the reflection caused by light refraction within the air gap.

Traditionally the only way to offset this effect is to increase the brightness of the panel or the use passive filtering techniques such as using transflective polarisers or contrast enhancement filters. These in turn would cause additional issues including increased power consumption / additional heat generation and the additional filters do not offer much improvement.

More recently the process of Optical Bonding has become more popular method of enhancement. This is a process of filling the airgap with an optical gel thus eliminating the gap and reducing the internal reflections.

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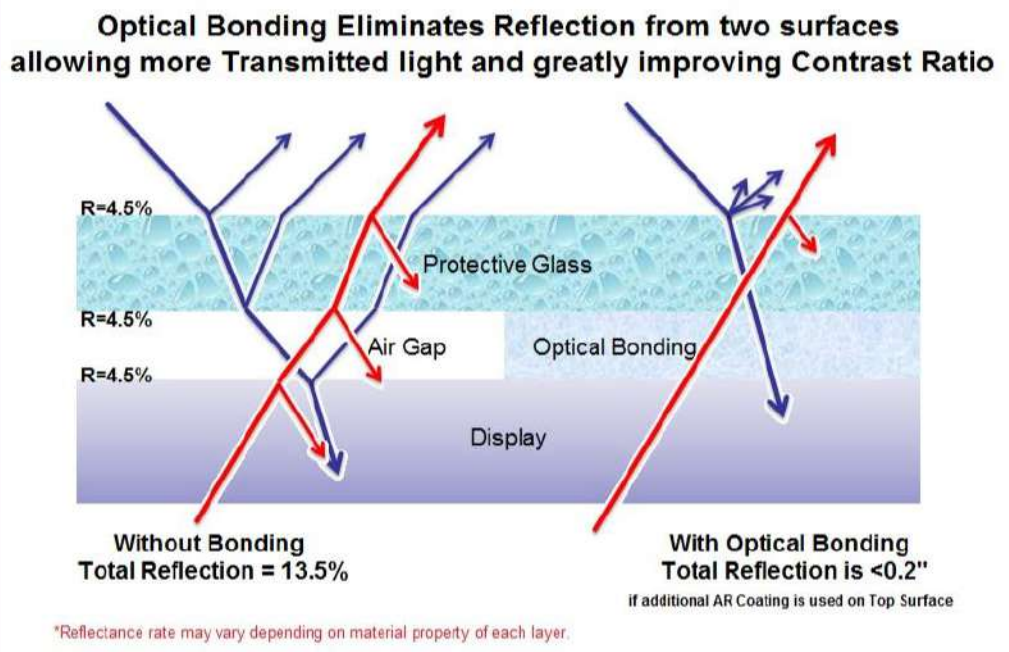
How does it work?

The Optical Bonding Technology LucidBond™ & ArmorBond™ is the process of fixing a cover lens, such as anti-reflective glass, or touch panel directly onto a display and eliminating the air gap in between in order to reduce reflectance to as low as 0.2% and dramatically increase contrast ratio in a high ambient light environment.

LucidBond™ is the process of bonding directly onto the display itself and ArmorBond™ the process of laminating the touchscreen to a cover glass



The technology also allows designers and mechanical engineers to design a larger oversize bespoke cover glass which can be shaped, branded and include other functionality.

It also allows for an edge to edge touch design where no front bezel / aperture is required. This is because not only does the bonding layer provide a much-improved impact absorption, but also gives a much better support of the cover lens

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Cover-glass selection

As optical bonding is the application of an optical gel between two layers the selection process of the cover 'substrate' is as critical as the process itself. At CDS we have the experience and knowledge to guide through the glass selection process where every requirement is treated as individual.

With a premium optical bonded solution, we would always propose a premium glass.

With the glass choice, CDS always consider a number of characteristics, including:

- **Thickness**
- **Toughening method**
- **Edge finish**
- **Custom shape**
- **EMC protection (Mesh / ITO)**
- **Rear printing (branded glass)**
- **Surface finish (AG / AR / AFP)**
- **UV / IR protection**
- **Apertures, cut outs & holes**
- **Privacy filters**

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Touch screen selection

The majority of touchscreen technologies are suitable for use with optical bonding. Almost all new designs utilise the more modern PCAP (Projective Capacitive) technology due to the flexibility, we are able to support most touch technologies

PCAP Technology

Projective CAPacitive touchscreen allows for the maximum flexixibity to give a modern 'tablet-esque' look – an edge-to-edge bezel-less touch glass. The touch sensor is laminated behind the bespoke cover glass and 'tuned' based on the surrounding electronics and touch requirement including glass thickness, gloved finger, and water rejection

The technology is a true multitouch design typically allowing for a min of 10 touches

Resistive technology

More recently the process of Optical Bonding has become more popular. This is a process of filling the airgap with an optical gel thus eliminating the gap and reducing the internal reflections.

Surface capacitive technology

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IR (infrared) technology

One of the original touch technologies was IR – this is where a bezel surrounds the LCD and an array/matrix of beams

SAW (surface acoustic wave) technology

Xzc c zk czn czxn czxcm More recently the process of Optical

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Components product range

Displays

Displays

TFT Displays | Electroluminescent (EL) Displays | Transparent LCD | HB Sunlight readable LCD | Stretched Displays | E-Paper

Interface Boards

Interface Boards

AD Boards and kits including inputs for HMDI | DVI | VGA | DP | Y/Pb/Pr | CVBS/S-Video and can support panels up to 4K

Touch Sensors

Touch Sensors

Analogue resistive | PCAP Touch foil | PCAP touch screen | SAW touch | IR touch

Embedded Boxed PC Systems

Embedded

Box PC’s | Panel PC’s

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Increased contrast and viewing angle

By filling the airgap between the display and cover substrate layers, the internal reflections are reduced, and refraction is improved.
This massively improves the contrast, i.e. more defined blacks and brighter whites and a reduction the display ‘wash out’ effect.

Bonding of sizes up to 75”

The process we use allows us to bond display up to 75”. We have a specific range of high bright displays which we promote as having been designed for the bonding process, but this range is not limited. We have access to all the major manufacturers including AUO, CMO, Tianma, NLT, Mitsubishi, LG and Samsung etc. we are able to optically bond.

UV protection / UV Resistance

The optical gel material has UV protection properties

Extended temperature

The thermal properties of the optical gel

Improved visual quality

Fully re-workable

No condensation & contamination

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