



5.4" LCD with protective glass

Air gap between LCD and cover glass - disturbing reflections

Gap between LCD and cover glass filled with DELO's optically clear adhesive - reflections are significantly reduced

Display bonding

DELO's newly developed optically clear adhesives combine excellent adhesion and durability with high transparency. They enable fast and flexible production processes. The index-matched adhesive improves the readability of the display in bright surroundings, for example under direct sunlight, and reduces fogging. But they offer even more: Thanks to their dual curing capability they do not only cure by exposure to UV or visible light. In shadowed areas, they cure through a reaction with air humidity.

Product properties

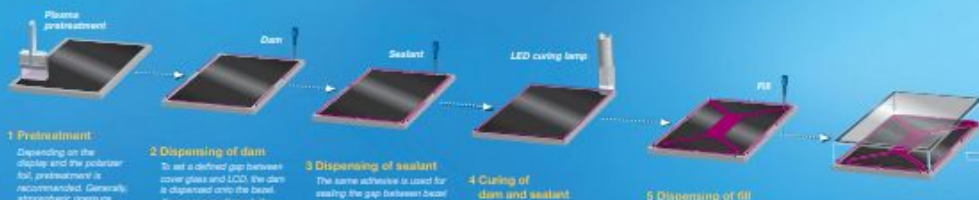
- Optically clear and highly transparent
- No yellowing under sunlight
- Extremely flexible to allow bonding directly onto LCD
- Dual curing capability for light and humidity
- Good adhesion
- Good humidity resistance
- Low shrinkage

Customer's benefits

- No disturbing internal reflections
- Reliable and complete curing even in shadowed areas (with dual-curing products)
- No contamination, condensation or fogging
- Improved shock and vibration resistance
- Low viscosity allows easy dispensing and joining without bubbles
- Liquid adhesives facilitate fast product developments and new designs



Filling the gap between LCD and cover glass with an index-matched optically clear adhesive drastically reduces internal reflections.



1 Pretreatment

Depending on the display and the polarizer foil, pretreatment is recommended. Generally, atmospheric pressure plasma increases the surface energy of the polarizer and improves the durability.

2 Dispensing of dam

To set a defined gap between cover glass and LCD, the dam is dispensed into the base. Air can escape through the vents in the following joining process (6).

3 Dispensing of sealant

The same adhesive is used for sealing the gap between bezel and display glass. This prevents contamination of the backlight and display electronics.

4 Curing of dam and sealant

The adhesive is cured within seconds using the DELOLUX 80 LED lamp.

5 Dispensing of fill

The optically clear fill material is dispensed in a defined pattern.

6 Joining

The cover glass is joined either parallel to the LCD or under a slight angle. The joining process and the dispensing pattern need to be properly adjusted to avoid bubbles during joining and reduce spill of adhesive.

7 Curing

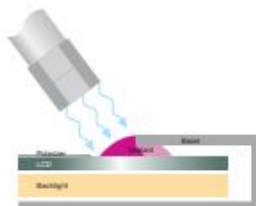
The adhesive is cured using an array of DELOLUX 20 LED area lamps. After less than a minute, the display is ready for handling. For dual-curing products, the adhesive in shadowed areas will reliably cure afterwards.

Bonding process

Sealing with a higher-viscosity material is necessary to prevent the low-viscosity optically clear adhesive from flowing inside the LCD from the side. The sealing adhesive is also dual-curing. Areas underneath the bezel not exposed to light solidify cure by humidity, preventing the adhesive from leaking throughout the display's lifetime. A defined distance between LCD and cover glass is set with the same adhesive. This time dispensed as a dam onto the bezel (see picture below). Once cured, it serves as a spacer between bezel and cover glass.



DELOLUX 80 enables short cycle times and fast curing within seconds.



Cross-section of an LCD illustrating the curing process of the sealant: dark magenta areas are cured by light, light magenta areas by humidity.



Cross-section of a bonded LCD indicating the sealant, the dam material, and the optically clear fill material.



The different sizes of the light wall series of DELOLUX 20 (100 mm x 100 mm) and DELOLUX 202 (252 mm x 49 mm) LED area lamps offer the greatest possible flexibility for your process.



Tests for customers can be carried out with a display bonding machine from company PVA (Precision Valve & Automation).



The adhesives are available in 30 or cartridge. The containers are particle-free and suitable for both UV/VIS-curing and dual-curing products. Larger containers, also appropriate for the storage of humidity-sensitive dual-curing products, are available on request.

