

CONTACT

DELO's dual curing technology

The dual curing mechanism developed by DELO combines two advantages: Curing on demand and reliable curing in shadowed areas. A black mask or other structures on the cover glass very often block light in parts of the bonding area. In these areas, standard UVor light-curing adhesives would remain uncured.

The consequence: The adhesive remains liquid and may leak from the gap later.

Two-component silicones would cure in these shadowed areas but they offer only limited processing times. In addition, accelerating the curing process requires additional heating steps.

Area curing by light



Fast light curing within seconds polymerizes the adhesive through the glass plate and from the side when required.

Shadow curing by humidity



Adhesive in shadowed areas is polymerized by humidity and is reliably cured that way.

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Optically Clear Adhesives

For Display and Touch Panel Bonding







8.4" 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



plasma increases the surface energy of the polarizer and improves the durability.

vents in the following joining process (#6).

Display bonding

Bonding process

Sealing with a higher-viscous material is necessary to prevent the low-viscous 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 reliably 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.

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



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

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



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

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

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

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.



contamination of the backlight

and display electronics.

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 exit areas of DELOLUX 20 (100 mm × 100 mm) and DELOLUX 202 (202 mm × 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 32 oz cartridges. The containers are particle-free and suitable for both UV/VIScuring and dual-curing products. Larger containers, also appropriate for the storage of humidity-sensitive dualcuring products, are available on request.

