DELO's dual curing technology

The dual curing mechanism developed by DELO combines two advantages: Curing on demand and reliable curing in shadowed areas. This is especially important for display and touch panel bonding, where structures on the cover glass may block light in parts of the bonding area. In these areas, standard UV- or 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.

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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 adhesives improve the readability of the display in bright surroundings, for example under direct sunlight, and reduces fogging.

1 Pre-treatment
   - Plasma pretreatment increases the surface energy of the display and improves the durability.
2 Dispensing of dam
   - To get a defined gap between cover glass and LCD, the gap is filled with DELO’s optically clear dam material. The dam material is dispensed as a dam material, and the optically clear fill material.
3 Dispensing of sealant
   - The same adhesive is used for sealing the gap between bezel and cover glass. This prevents the low-viscous optically clear adhesive from flowing inside the LCD from the side.
4 Curing of dam and sealant
   - The adhesive is cured using an array of DELOLUX 80 LED area lamps. After curing, the dam, the sealant and the optically clear fill material are ready for handling.
5 Dispensing of fill
   - The optically clear fill material is dispensed in a defined pattern.
6 Joining
   - The cover glass is joined either parallel or tilted to the LCD under a slight angle. The joining process and the dispensing pattern need to be properly adjusted to avoid bubbles during joining and reduce yield of adhesives.
7 Curing
   - The whole is cured using an array of DELOLUX 20 LED area lamps. After curing, the whole is ready for handling.

Product properties
- Optically clear and highly transparent
- No yellowing under sunlight
- Extremely flexible to allow bonding
- Dual curing capability for light and humidity
- Good adhesion
- Good humidity resistance
- Low shrinkage
- Low viscosity
- High temperature resistance
- Low dead volume

Customer’s benefits
- No disturbing internal reflections
- Reliable and complete curing even in shadowed areas (with dual-curing products)
- No contamination, cross contamination or fogging
- Improved shock and vibration resistance
- Low viscosity allows easy dispensing and joining without bubbles
- Dual curing adhesives facilitate fast product developments and free design
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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 under the bezel not exposed to light. The adhesive is cured within seconds using the DELOLUX 80 LED lamp.

The different sizes of the light exit areas of DELOLUX 30 (150 mm × 100 mm) and DELOLUX 32 (300 mm × 140 mm) LED area lamps offer the greatest possible flexibility for your process.

The adhesives are available in 32 oz cartridges. 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.

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

Watch the entire video presentation of DELOadhesives.

Follow the procedure step by step.