

**DELO**



## **Flexible Sealants**

**Humidity protection for  
flexible electronics**

# Adhesives for flexible electronics

Product life is a major issue in the commercial success of flexible electronics. Many of the materials used in OLED displays and organic photovoltaics are sensitive to ambient conditions, limiting their lifetime compared to conventional technologies.

Therefore, a key factor for commercialization is device encapsulation. This must be flexible and transparent and it must protect the sensitive chemicals in the device from humidity and oxygen. The biggest opportunity for OLED displays and organic photovoltaics is when they can be flexible as well as robust, allowing versatile applications and manufacture in large surface areas.

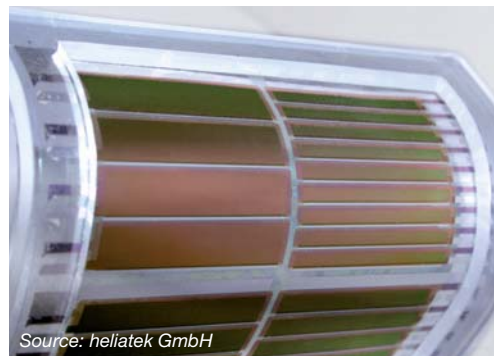
In cooperation with many international key players, DELO has developed special light-curing sealants with a high water barrier effect. The use of the right adhesive is decisive for a long service life of the display. Besides excellent adhesion to the materials used, such as barrier layers, ITO, etc., one of the most significant properties of the DELO adhesives is low water vapor permeation – also called WVTR value (WVTR = water vapor transmission rate).

DELO's new flexible sealants make a considerable contribution to the development of these up-and-coming technologies. These adhesives will be used in tomorrow's displays, and have already been successfully tested in roll-to-roll systems (R2R).



**Flexible displays**

Applications range from e-readers and rollable displays in mobile devices, to point-of-purchase displays or similar signage applications as shown in the picture. E-papers are power-saving and readability is excellent even in direct sunlight. Sensitive displays are protected by sealing the edges with DELO adhesives. This ensures a long service life (see also "Edge encapsulation" illustration on page 3).



Source: helliatek GmbH

Flexible solar cells must be protected against humidity to prevent degradation. This is done by bonding the cover film with low-permeation adhesives.



Source: Add-Vision

## Your advantage

### Efficiency

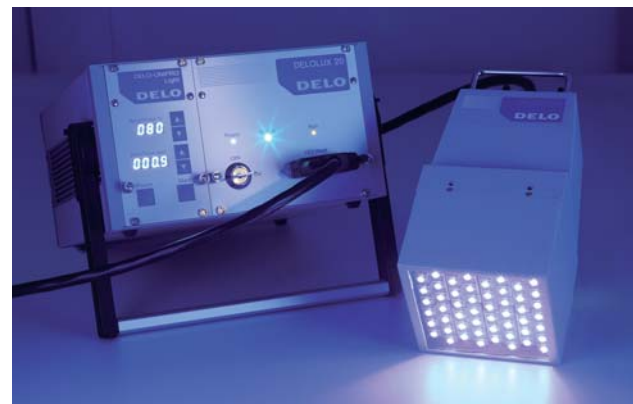
- Flexible adhesive for extensive applications in flexible electronics
- Fast curing for faster cycle times
- Edge sealing or complete lamination are possible
- Easy and thus cost-effective transport of the containers
- Price advantage (compared to heat-curing products) due to possibility of shipment in large containers up to 10 l
- Complete system solution with LED curing lamps available

### Increased quality

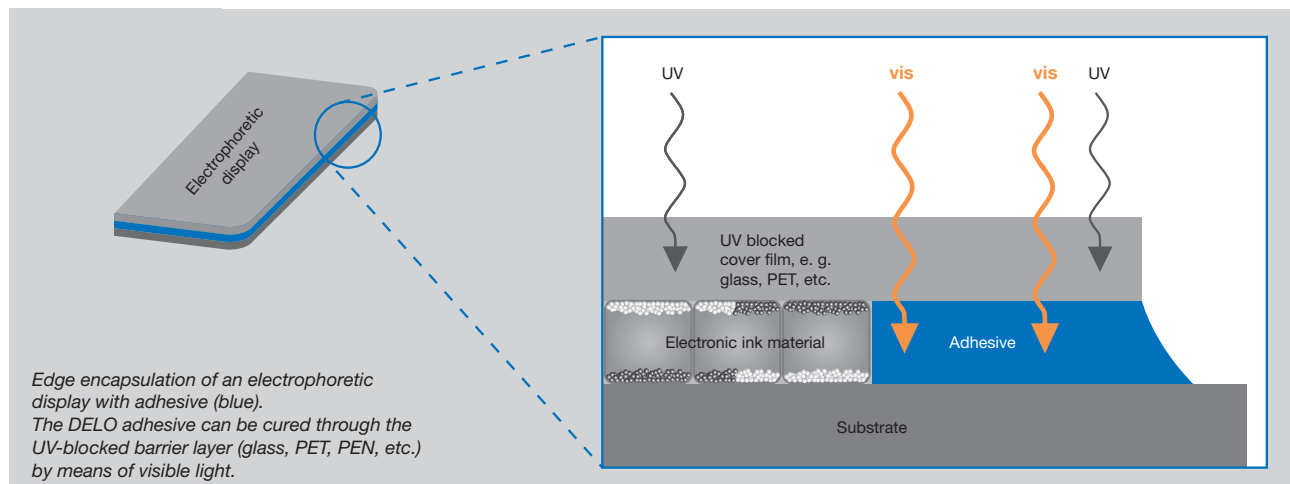
- Protection against humidity
- High long-term adhesion
- Long service life

## Product properties at a glance

- Low WVTR value for protection against humidity
- Very good temperature and humidity resistance
- Fast in-line curing within a few seconds
- Curing with visible light through UV-absorbing materials
- Long storage life (6 months at 0 to +10 °C)
- Long processing time (up to several weeks)
- Excellent adhesion to commonly used substrates like barrier layers, ITO, etc.
- High peel resistance (for flexible products)
- Low viscosities (down to 1,000 mPas) for capillating into the gap between substrate and cover are available



The DELOLUX 20 LED area lamp allows efficient and fast curing at a wavelength of 400 nm without exposing the often sensitive devices to UV light.



Edge encapsulation of an electrophoretic display with adhesive (blue).  
The DELO adhesive can be cured through the UV-blocked barrier layer (glass, PET, PEN, etc.) by means of visible light.

# Technical data overview

## Worldwide support

	DELO-KATIOBOND LP655	DELO-KATIOBOND LP VE19781	DELO-KATIOBOND LP VE19663
<b>Flexibility</b>	Low	Medium	High
<b>Viscosity [mPas], +23 °C</b>	10,000	800	1,800
<b>Recommended irradiation time [s] at 55–60 mW/cm<sup>2</sup> UVA</b>	60	60	60
<b>Elongation at tear [%]</b>	1	47	54
<b>Glass transition temperature [°C] (DMTA)</b>	170	96	31
<b>Curing wavelength [nm]</b>	320 – 440	320 – 420	320 – 420
<b>WVTR [g/m<sup>2</sup>d] +60 °C / 90 % r. h., normalized to 1 mm</b>	5	20	75

### Worldwide support



### Your contacts

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Adhesives

Dispensing

Curing

Consulting

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The data and information provided are based on tests performed under laboratory conditions. Reliable information about the behavior of the product under practical conditions and its suitability for a specific purpose cannot be concluded from this. It is the user's responsibility to test the suitability of the product for the intended purpose by considering all specific requirements. Type, physical and chemical properties of the materials to be processed with the product, as well as all actual influences occurring during transport, storage, processing and use, may cause deviations in the behavior of the product compared to its behavior under laboratory conditions. All data provided are typical average values or uniquely determined parameters measured under laboratory conditions. The data and information provided are therefore no guarantee for specific product properties or the suitability of the product for a specific purpose.

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