

Medical electronics

Medical-Grade Adhesives

for health-monitoring applications.



Medical-grade adhesives

Adhesive pr solutions

for medical technologies.

As medical care advances in both innovation and complexity, new devices emerge to treat various conditions. For **diabetes care management**, **health-monitoring trackers** or biosensors in **wearable devices** including smart watches, specialized materials like adhesives are essential.

At DELO, through extensive research and development, we have developed a range of adhesive materials that meet rigorous standards, including **ISO 10993-5** and **USP Class VI biocompatibility**. Our adhesives feature **IBOA-free** chemistry for safe contact with skin, fast curing for high throughput in mass production, and various functional attributes ideal for medical applications.



Visit our website.

go.delo.de/medical

Process



10+

curing process options, including heat, light, and dual curing.

— Adhesive

Applications

Continuous glucose monitoring

Nontoxicity is the top priority for any material used in assembling **continuous glucose monitoring** (CGM) sensors due to their constant contact with patients' skin.

Bonding tasks

- › Sensor protection potting
- › Contact patch connection
- › Sensor fixation
- › Housing bonding / sealing

Curing processes

- › Fast light curing
- › For shadowed areas or low temperature curing: preactivation or activation on the flow

Proven solution and experience

DELO adhesives have several properties that make them suitable for medical bonding applications. Their biocompatibility has been verified through the ISO 10993-5 cytotoxicity test, and they are available in IBOA-free variants. Fast curing times allow for high throughput, enabling sensors to be distributed to patients more quickly.



The importance of IBOA-free

IBOA (isobornyl acrylate) is a chemical commonly found in adhesives and other polymers, including those used in medical wearables. However, this chemical is also a skin sensitizer that can cause irritation following prolonged exposure. To this end, for on-skin medical wearables such as glucose monitoring patches, ensuring adhesives used comprise an IBOA-free chemistry is critical.



— Adhesive

Product features

Sensor protection potting	Contact patch connection	Sensor fixation	Housing bonding / sealing
 › Hydrophobic, low permeation DELO PHOTOBOND › Very fast curing < 2 s › Tailored flow behavior, adapted viscosity › Low water absorption	 › Constant processing behavior › Electrically conductive › High coating thickness with fast curing to embed the needle › Low-temperature-curing	 › Firm enough to fix the needle, flexible enough to compensate for body movement › Fast curing	 › Tension-equalizing › Good adhesion to various plastics like COC › Low water absorption

Applications

Biosensors in wearables

Smart watches and **rings** rely on biosensors as essential components to enable integrated features like heart rate monitoring and sleep quality assessment. In addition to **sealing sensor housings**, DELO's adhesives also serve as optical materials for **LED** and **spectral chip packaging**.



Bonding tasks

- › Bonding ECG electrodes
- › Housing bonding
- › Cover glass bonding
- › Packaging of PPG module

Curing processes

- › Fast low-temperature curing
- › Dual initiator
- › Light activation

Product features

Optical-grade adhesives

DELO optical-grade adhesives are specially designed for optical elements like LEDs and spectral chips in biosensors. Fast curing allows for higher throughput, increasing overall production efficiency. Having constant contact with skin makes the material's biocompatibility extremely important.

Bonding ECG electrodes



- › Fast low-temperature curing
- › Black adhesive
- › Good drop test ability
- › Good media resistance, tested for artificial sweat and sunscreen

Housing bonding



- › Good adhesion to various plastics
- › Preactivated adhesives for shadowed areas

Cover glass bonding



- › Direct illumination for DELO PHOTOBOND or preactivation with DELO PHOTOBOND LA in case of black print

Packaging of PPG module



- › Optical clear potting
- › Light-blocking dam
- › LCP cap bonding
- › Die attach

Applications

Microfluidics

In the field of medical electronics, microfluidics are used in numerous applications, including **lab-on-a-chip**, **point-of-care diagnostics**, and **therapy monitoring**. Medtech companies can benefit from DELO's expertise in optoelectronics and miniaturization when using its adhesives in their products.



— Adhesive

Bonding tasks

- › Structure, e. g., optical grating
- › Bonding / sealing
- › Sensor integration / chip bonding

Curing processes

- › Imprint and inkjet printing
- › Light curing
- › Dual curing: light and humidity, light and heat

Several adhesive benefits

DELO's adhesives offer various advantages in microfluidics applications. Features like curing in shadowed areas and optional activation on the flow increase throughput and design freedom, while biocompatibility makes these materials ideal for medical use.

Product features

Structure, e. g., optical grating



- › Imprint for optical applications with various refractive indices
- › High transmission
- › Micro dam

Bonding / sealing



- › Good adhesion to COC
- › Low water absorption
- › Inkjet-printing capable

Sensor integration / chip bonding



- › Flow activation possible
- › Micro dam
- › Preactivated DELO KATIOBOND enables curing in shadowed areas

Applications

Smart pills

Innovations like **smart pills** and **RFID sensors in pill bottles** are complex products due to their many components. DELO's adhesives play an integral role in assembling these technologies, ensuring reliable drug delivery.



Bonding tasks

- › Sensor bonding
- › Battery bonding
- › RFID chip bonding

Curing processes

- › Light curing (standalone)
- › Dual curing: light and heat
- › Fast thermode curing of anisotropic conductive adhesives

Smart drug delivery

Innovation in drug delivery methods are being made, including smart pills that collect data as they travel through the body, and RFID pill bottle labels that track how often pills are removed from the container. This helps to monitor patients' adherence to their prescription and prevent drug misuse.

Product features

Sensor bonding



- › Predictable shrinkage and low swelling to avoid any out-of-focus movement
- › Fast light fixation down to 1 s

Battery bonding



- › Balanced combination of flexibility and adhesion
- › Light-fixable
- › Low outgassing

RFID chip bonding



- › Fast and reliable ACA adhesive (anisotropic conductive)

Applications

Insulin patch pump

Adhesives used in **needle and housing bonding** enhance the miniaturization of **insulin patch pumps**. They offer the ideal combination of firmness and flexibility, ensuring secure attachment even during body movement, leading to more comfortable and long-term use.



— Adhesive

Bonding tasks

- › Potting
- › Fixation
- › Housing bonding / sealing

Curing processes

- › Light curing (standalone)
- › Dual curing: light and heat

Enhancing patients' lives

Insulin patch pumps revolutionize diabetes care by removing traditional injections. They offer a user-friendly solution for those managing their insulin levels. The adhesive technology used is crucial in ensuring the durability and reliability of these innovative wearables.

Product features

Potting



- › Hydrophobic, low-permeation DELO PHOTOBOND
- › Very fast curing < 2 s
- › Tailored flow behavior, adapted viscosity
- › Low water absorption

Fixation



- › Firm enough to fix the needle, flexible enough to compensate for body movement
- › Fast curing

Housing bonding / sealing



- › Tension-equalizing
- › Good adhesion to various plastics like COC
- › Low water absorption
- › Less leachable and extractables

Adhesives for all processes

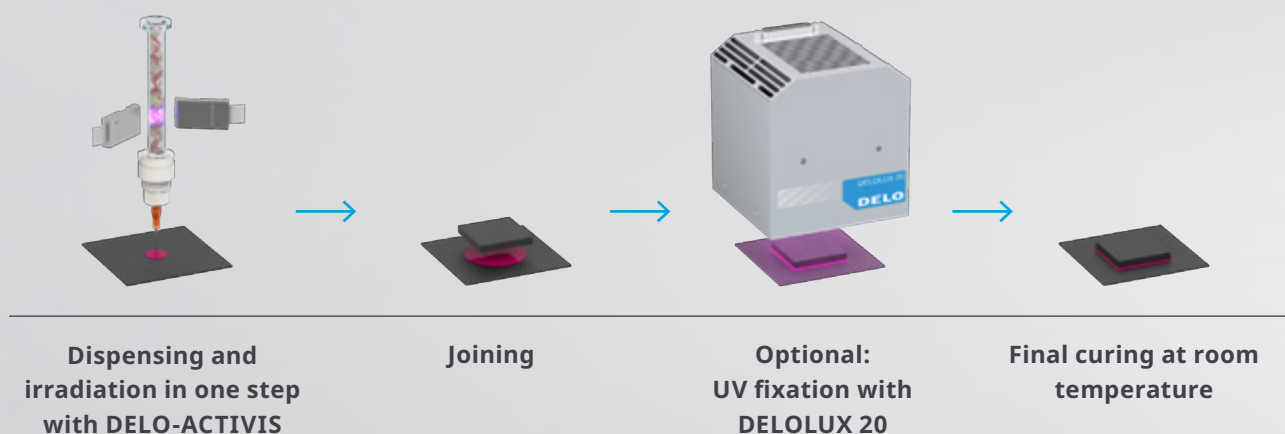
DELO versatile adhesives are **compatible** and can be used in **all curing processes** commonly found in the manufacture of medical electronics. These include light curing, heat curing, and secondary curing processes, such as exposure to heat or humidity.

DELO offers materials with **preactivation technology**, a process that leverages light curing for opaque materials. In the **activation on the flow** process, adhesives also feature dual-initiator systems, combining preactivation with additional light fixation for further processing.

In addition to our close collaboration with several medtech companies, we have decades of experience partnering with **leading electronics manufacturers** from across the globe to identify the most effective solutions for their specific needs.

Maintaining these close and long-standing partnerships enable us to deliver **reliable products** and **consistent performance**—giving our customers confidence and peace of mind.

Activation on the flow – Process



DELO-ACTIVIS

Activation on the flow

Dispensing and curing in one step

With activation on the flow and DELO-ACTIVIS, DELO has developed a technology that for the first time combines the dispensing and preactivation of adhesives with UV light in one step.

The curing process begins as soon as the adhesive is irradiated with UV light. This process allows **complex geometries**, such as shadowed areas with undercuts, to be bonded or sealed quickly.

As a **timesaving, cost- and energy-efficient technology**, activation on the flow can be an alternative to heat curing, dual curing (light fixation and heat curing) or two-component curing.

Dispensing without a curing oven leads to **faster production processes**, **lowers production costs** and significantly **reduces carbon emissions**.



Your benefits at a glance

>50%

cost savings by
DELO-ACTIVIS compared
to heat curing*

>98%

reduced carbon emissions
without heat curing*

100%

design freedom
for all geometries

* Theoretical calculation for rotor position sensor encapsulation at a European production site.

DELO Industrial Adhesives

**China | Czechia | France | Germany HQ | Italy | Japan
Korea | Malaysia | Singapore | Thailand | USA**

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