

DELO

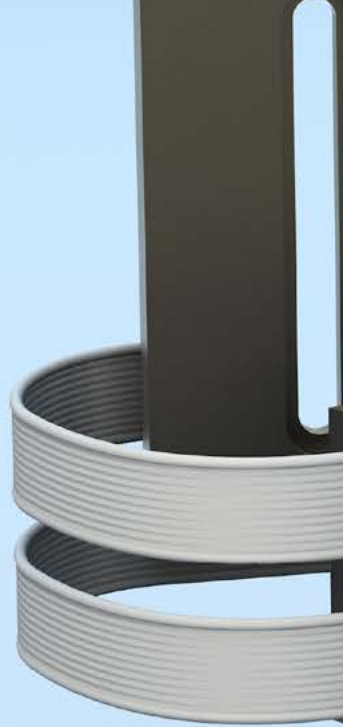
ACTIVATION ON THE FLOW

Process, device,
and adhesive



Activation on the flow

Innovative process technology for high-tech adhesives



In addition to mechanical and adhesive properties, a particular focus is placed on process issues when choosing the adhesive for a specific application.

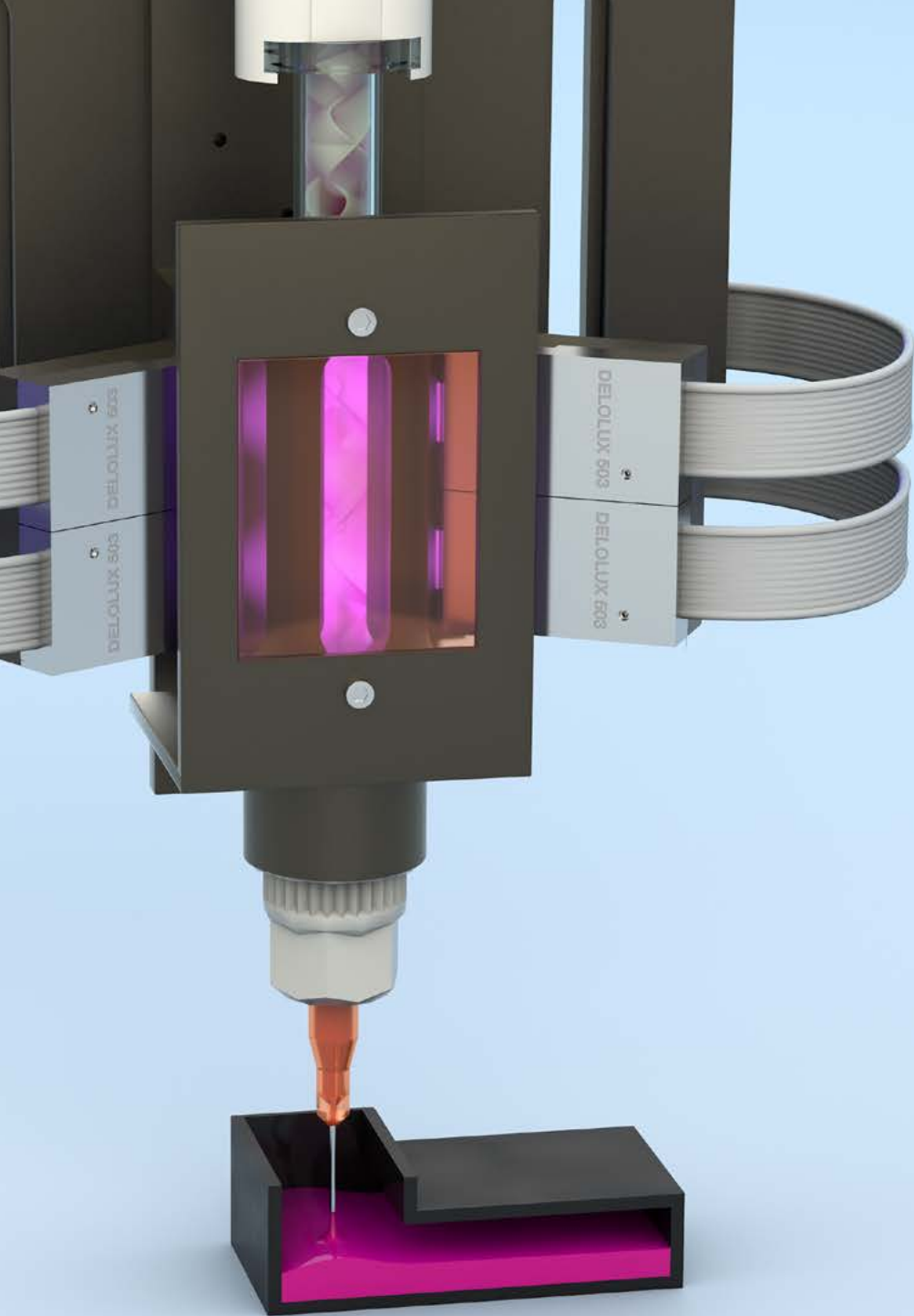
With activation on the flow, DELO has developed a technology that combines for the first time the process steps of dispensing and preactivation. This opens up a wide range of new possibilities for product and process design.

As an efficient and resource-saving technology, activation on the flow is an ideal alternative for heat curing, dual curing, and two-component curing processes. It ensures fast production processes, reduces production costs, and improves the CO₂ footprint.



Discuss your project and your requirements with our experts:

AoF-experts@DELO.de



Your benefits at a glance:

100 %

design freedom

> 50 %

process cost savings

> 98 %

CO₂ reduction

Process

Activation on the flow is a further development of preactivation known in the industry. What is different from previous process designs, however, is the moment of irradiation. With this process technology, irradiation takes place not after, but during dispensing, creating new scope for innovation.

Activation on the flow

1 Dispensing and irradiation in one step

Already during the dispensing process, the entire adhesive volume is irradiated at a wavelength of 400 or 460 nm. The light activates the process of adhesive curing, converting the adhesive into a specific state, from which the so-called open time begins.

2 Joining of components within 5 to 10 minutes

Within the open time of 5 to 10 minutes, the adhesive has good flowability and sufficient wettability to reliably join or encapsulate substrates.

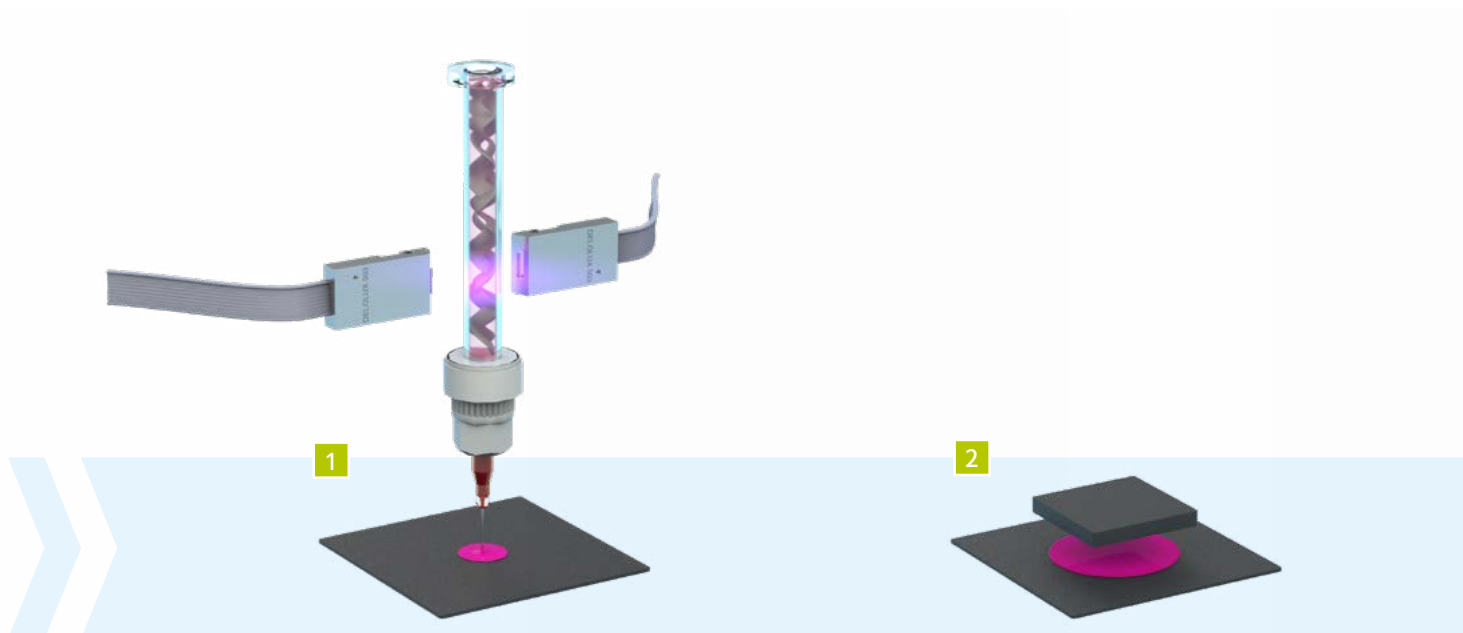
When designing the process, the open time must therefore be taken into account according to the respective application. Flow rate and quantity of the adhesive also play an important role.

3 Optional: UV fixation at 365 nm

The exposed adhesive areas can be irradiated again in an optional UV fixation step. This gives the adhesive its immediate initial strength and the components can be further processed right away in the production chain without them slipping.

4 Final curing at room temperature

The (non-fixed) adhesive cures to final strength at room temperature without any further step and then adopts its characteristic properties.



Dispensing and irradiation in one step

Joining of components within 5 to 10 minutes

Dual-initiator adhesives

For the process of activation on the flow, DELO has developed special adhesives based on epoxy resin. The patented DELO KATIOBOND FA products are provided with so-called “dual initiators”. Their distinctive feature is that they react to different wavelengths so that the adhesive cures more slowly or more quickly. It is only thanks to this mechanism

that activation on the flow and optional light fixation are possible. The process design can be adapted to optimally satisfy the requirements. The one-component adhesives are available with different mechanical properties and are highly resistant to media and temperature in the cured state.

DELO KATIOBOND FA

	Hard	Medium	Flexible
Young's modulus	> 10,000 MPa	1,000 – 8,000 MPa	< 25 MPa
Tensile strength	> 40 MPa	20 – 40 MPa	< 20 MPa
Elongation at tear	< 10 %	5 – 20 %	> 100 %
Viscosity [10/s]	~ 8,000 mPa·s	~ 700 mPa·s	~ 7,000 mPa·s
Special features	<ul style="list-style-type: none"> › Media-resistant › Good flowability › Temperature-resistant › Low CTE 	<ul style="list-style-type: none"> › Media-resistant › Good flowability 	<ul style="list-style-type: none"> › Media-resistant › Good flowability › Flexible

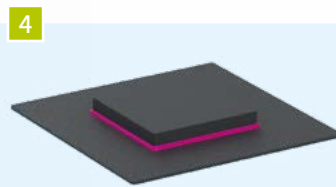
RoHScompliant 

Halogenfree 

SVHCfree 



Optional: UV fixation at 365 nm



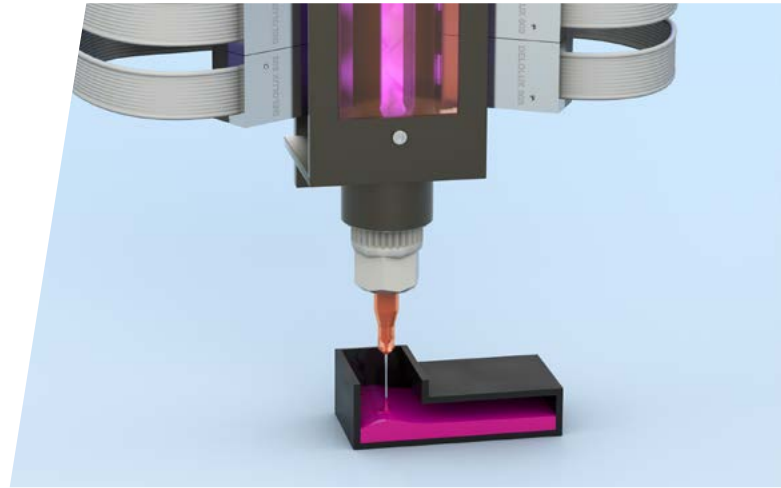
Final curing at room temperature

Advantages of activation on the flow

Maximum design freedom

Activation on the flow pushes the limits of design and creates maximum space for product innovation. This process technology is just as suitable for opaque components as it is for complex geometries with undercuts and shadowed areas. The adhesive already being activated, it cures reliably in all areas.

Such freedom of design is not given with conventional light-curing processes, in which the adhesive is irradiated only after dispensing. This is because the entire adhesive volume must be reached by light for complete curing.

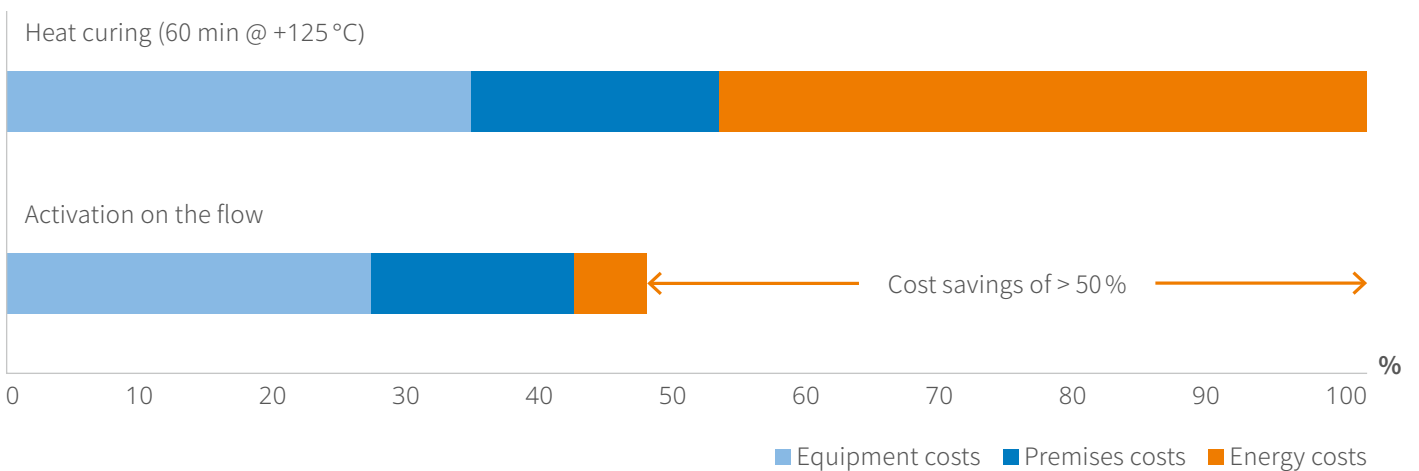


Reduction of process costs

Thanks to the activation on the flow, you can save a complete process step when potting, encapsulating or bonding components. The optional step of light fixation additionally gives the exposed adhesive area its initial

strength at the touch of a button, and the components can be further processed directly. This helps save valuable time and enables cost-efficient processes, with significant energy savings compared to conventional heat curing.

Process costs



Based on



500 k parts per year



60 s cycle time



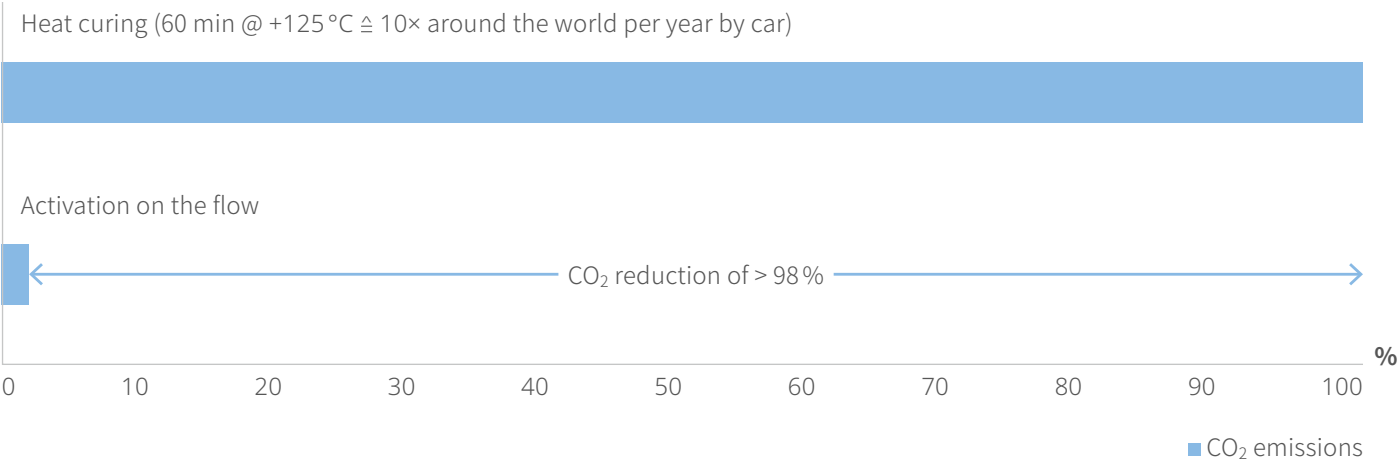
Activation on the flow vs. conventional light curing: activation on the flow guarantees reliable curing in shadowed areas.

Improved CO₂ footprint

Activation on the flow is a resource-saving and efficient process. It contributes significantly to reduced energy consumption and CO₂ emissions. This is particularly evident when compared to heat curing processes, such as those typical in the automotive industry. For large-scale production lines with oven stations and a production

rate of 500,000 components per year, annual carbon dioxide emissions can be reduced by 98%. This is roughly equivalent to the amount of CO₂ emissions released into the environment by a passenger car after ten circumnavigations of the earth (435,000 kilometers driven).

CO₂ emissions



Based on

- 500 k parts per year
- 60 s cycle time

Activation on the flow made possible by a special device

DELO-ACTIVIS 600, which enables the process of activation on the flow, consists of two main components: a dispensing unit and a curing unit.

Dispensing is done on a volumetric basis using cartridges or bulk containers, at a precisely defined flow rate.

The core of the curing unit is a translucent standard mixing tube and four integrated and individually controllable

DELOLUX 503 lamp heads, operating at a wavelength of 400 or 460 nm. The mixing coil in the mixing tube ensures uniform irradiation of the adhesive during dispensing. The dispensing needle to be connected to the mixing tube can be selected depending on the dispensing task.

DELO-ACTIVIS 600 can be used as a stand-alone device or easily integrated into existing production systems.

Dispensing unit:

Type of dispensing unit	Volumetric dispenser
Designation of dispensing unit	DELO-DIV VD600
Media viscosity	Aqueous to pasty
Dispensing volume flow (typ.)	1.4 to 16 ml/min
Min. dispensing volume (typ.)	0.03 ml
Media routing	Via mixing tube
Control unit used	DELO-DIV pilot 1i

Curing unit:

Type of curing unit	LED spot lamp head
Designation of curing unit	DELOLUX 503
Lamp head cooling mechanism	Passively cooled
Number of lamp heads in the system	Up to 4 heads; individually controllable
Control unit used	DELOLUX pilot S4i

Overall system:

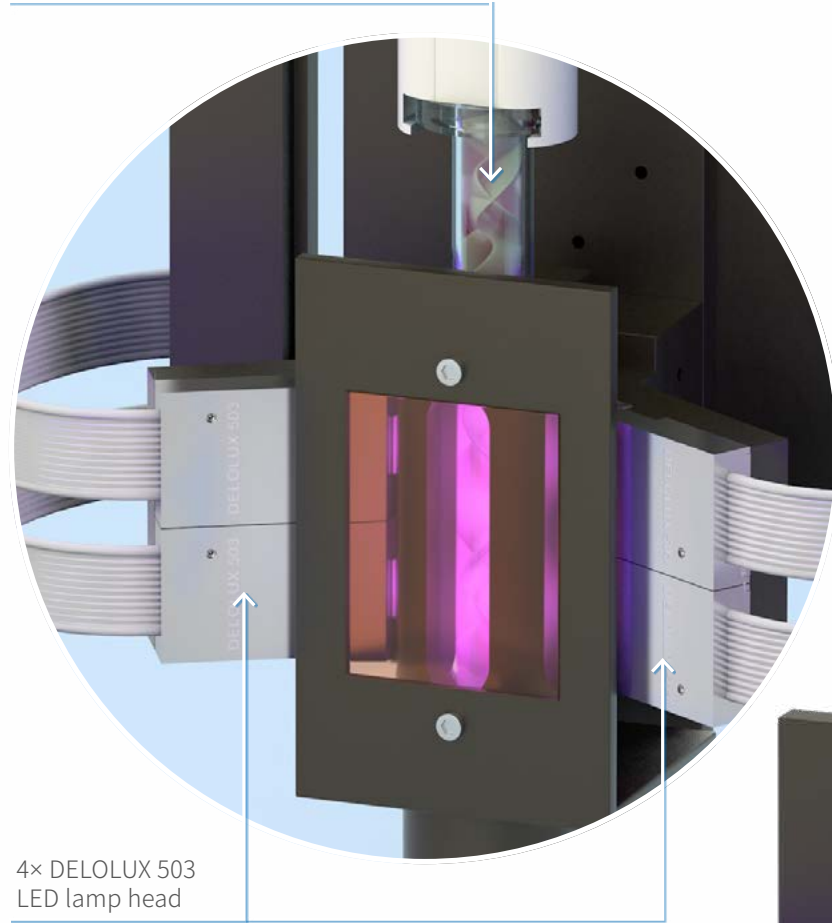
Dimensions	465 mm × 100 mm × 60 mm
Weight	1,400 g
System control	PLC interface



Like all DELO devices, DELO-ACTIVIS 600 is developed and manufactured in Windach according to the highest quality standards.

DELO-DIV VD600 volume dispenser

Standard mixing tube



4x DELOLUX 503
LED lamp head

Viewing window

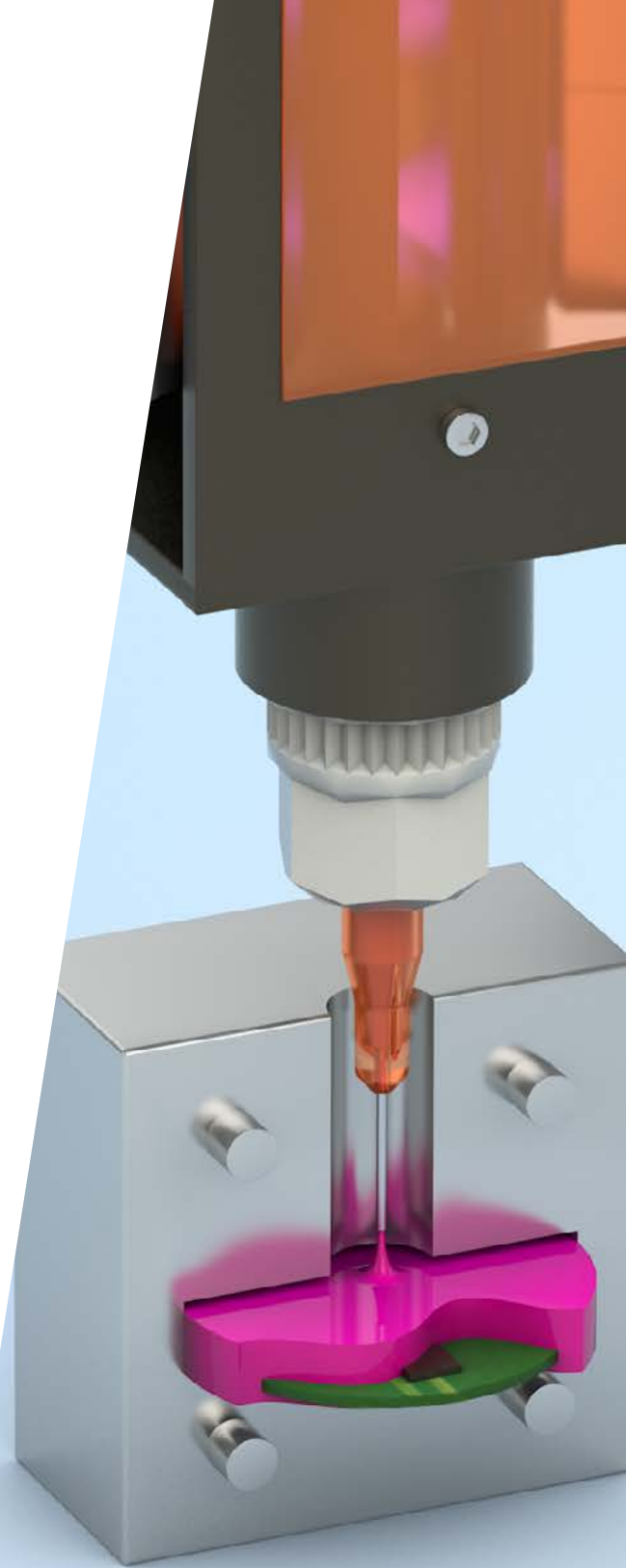
Dispensing needle



Application examples

Activation on the flow is a versatile technology that enables fast and efficient light-curing processes for opaque components and complex geometries. It is particularly suitable for bonding temperature-sensitive components in a gentle way without heat input and with low stress. The process technology is also ideal for sensor potting and connector pin sealing.

The optional light fixation step, which can be integrated into the overall process thanks to the special dual-initiator adhesives, additionally enables fast handling and production processes that involve inline inspection, because the components can be tilted or loaded within a few seconds without the risk of the bond coming loose. In the case of potting and encapsulation, light fixation of the upper adhesive layer creates a protective capping layer. This prevents the liquid adhesive underneath from leaking and the component can be further processed.

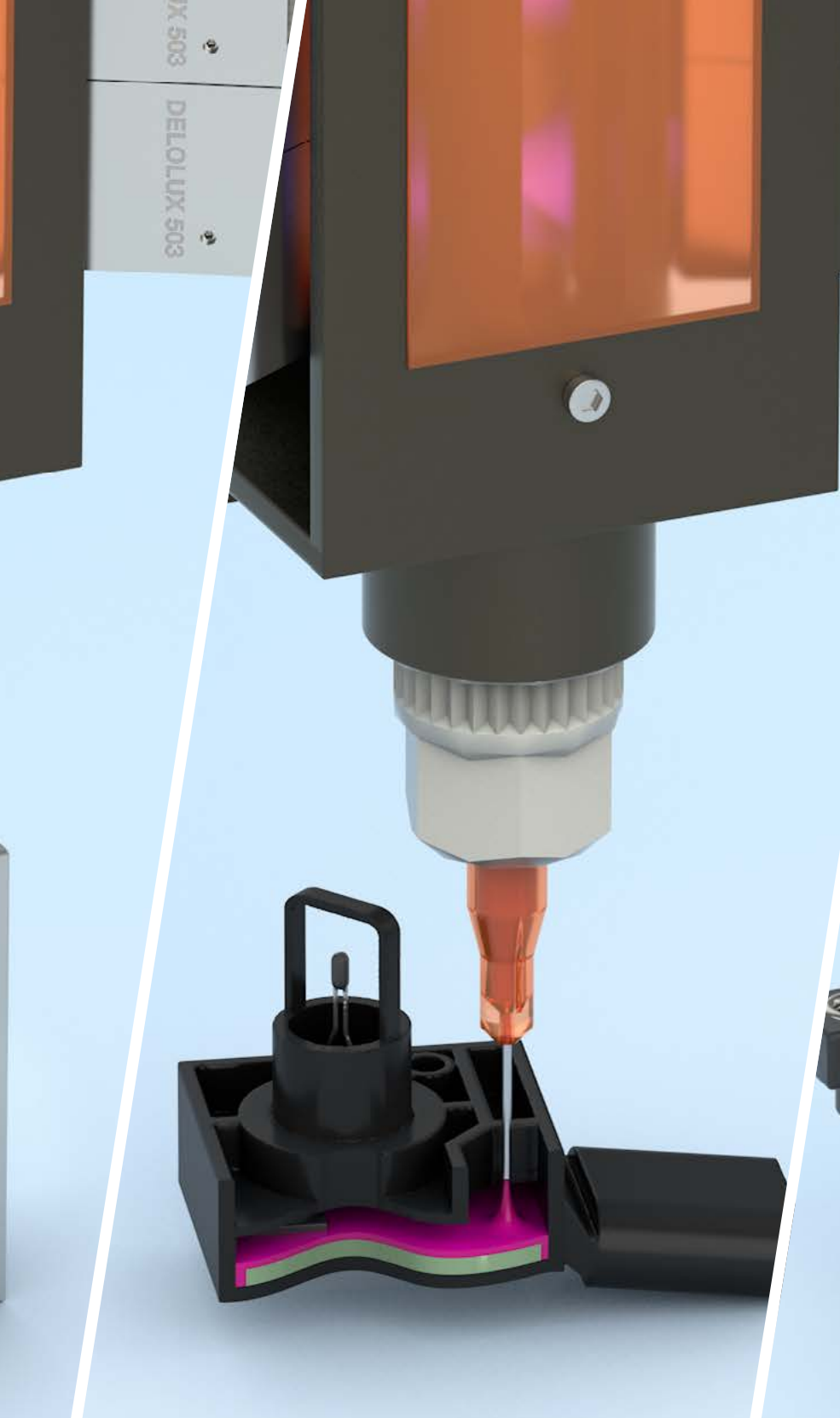


Encapsulation of electronic components



Discuss your project and your requirements with our experts:

AoF-experts@DELO.de



Sensor potting



Pins and connector sealing

DELO

DELO Industrial Adhesives

China | Germany HQ | France | Italy | Japan | Korea
Malaysia | Singapore | Thailand | Czech Republic | USA

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 customer's responsibility to test the suitability of a product for the intended purpose by considering all specific requirements and by applying standards the customer deems suitable (e.g. DIN 2304-1). 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. Nothing contained herein shall be construed to indicate the non-existence of any relevant patents or to constitute a permission, encouragement or recommendation to practice any development covered by any patents, without permission of the owner of this patent. All products provided by DELO are subject to DELO's General Terms of Business. Verbal ancillary agreements are deemed not to exist.

The technical data is for informational purposes only. Specific values can be found in the user manual. It is the user's responsibility to test the suitability of the device for the intended purpose by considering all specific requirements. If you need support in using the devices, please feel free to ask your contacts in our Engineering Department.

© DELO – This brochure including any and all parts is protected by copyright. Any use that is not expressly permitted by copyright law requires the prior consent of DELO Industrial Adhesives. This applies in particular to duplication, distribution, processing, translation, and microfilming as well as storage, processing, duplication, and distribution using electronic systems.

CE

www.DELO-adhesives.com

