

## Instructions for Use & General Information on the Product Group

## DELO DUALBOND®



### Application areas

DELO DUALBOND products are predominantly used in electronics, microelectronics, electrical engineering, precision engineering and sometimes in mechanical engineering for bonding, fixing or potting/encapsulating. Prefixation by means of a light source is possible. DELOLUX® curing lamps are recommendable. Curing until final strength and in shadowed areas requires one heat curing step. Light fixation is optional.

### Preparation of the components to be bonded

The surfaces to be bonded must be dry, free of oil, grease and other contaminations in order to achieve optimal bond strength. You can find more details in the technical information about cleaning agents.

Condensation water on components must evaporate before adhesive application. Residues of the cleaning on the substrate are to be avoided.

Depending on the substrate, defined drying may be necessary for optimal results.

After cleaning, adhesion to the component can be further improved by surface pretreatment.

The suitability and strength of the adhesive are to be verified on original components under application-specific conditions.

## Preparation of the adhesive

Adhesives of the DELO DUALBOND® product group are supplied ready for use. In case of cool or refrigerated storage, the containers must be conditioned to room temperature before use. The containers are conditioned at room temperature (approx. +77°F (+23°C), ~50 % r.h.). Heat addition is not permissible. The conditioning times depend on the container size and the storage time.

You can draw details from the specific Technical Data Sheet.

Condensation water on the substrate should be prevented. Blistered products may be humidity-sensitive.

The adhesive must not be frozen and thawed again.

## Processing

After conditioning to room temperature, the products can be directly applied from the container or with a dispensing system.

Dispensing valves and product-guiding components must be thoroughly cleaned directly before use of the adhesives. Residues of other products must be removed completely. Acetone or BDGA (butyl diglycol acetate) in combination with acetone are recommended as cleaning agents. You can find more details in the technical information about cleaning agents. The cleaning agent to be used also depends on the dispensing equipment manufacturer's specifications. We recommend using dispensing valves and product-bearing elements made of inert and totally opaque material. Suitable materials include PE, HDPE, PP, PTFE and stainless steel. Other materials require compatibility assessment. The use of polyurethanes is not recommended.

Processing of DELO DUALBOND® products from original containers as intended is effected at a temperature of approx. +77°F (+23°C) and a relative air humidity of ~50%. So far, we have not made any negative experience as to processing under these conditions.

The products could be processed very well under laboratory conditions and no impairment of the processing properties could be recognized.

The product-specific processing time of the specific product can be found in the corresponding technical data sheet.

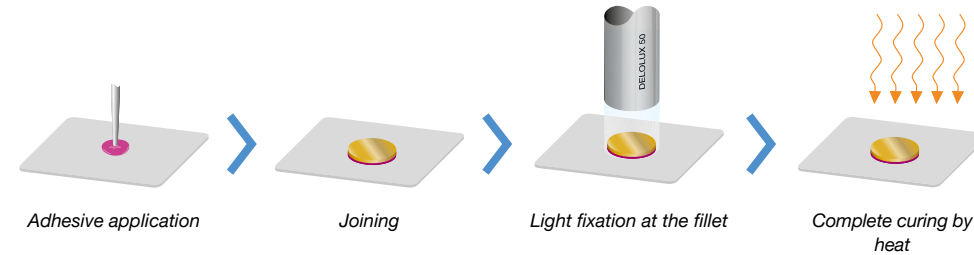
After adhesive application, the components are to be joined and possibly light-fixed speedily as fixation of the products may already start through room lighting and scattered radiation. Shielding the work station from light in the adhesive's curing spectrum can prevent a starting and undefined pre-fixation. Adhesive containers and dispensing tips must be protected or shielded against light. When exchanging the container, no scattered light may reach the inside of the container as this may trigger the polymerization. As adhesives may be sensitive to humidity due to their chemical nature, processing should continue preferably quickly after adhesive application. Too long humidity influence can impair the achievable properties, such as adhesion or glass transition temperature.

Containers must be reclosed when not in use. Dispensing needles must be cleaned or exchanged after downtimes.

## Adhesive application/joining/curing

Production process when bonding components by light fixation:

1. Preparation of the adhesive and the components
2. Adhesive application to one component
3. Joining
4. Light fixation of the components at the fillet by exposure to UV or visible light in the necessary wavelength range.
5. Curing of the adhesive by heat



The adhesive can be cured by heat addition as well as by a combination of light and heat. Complete curing by light is not possible. Adhesive which is not reached by light can be completely cured by subsequent heat addition. Light fixation of adhesive subareas, for example the fillet, can cause initial strength of the joined connection, so transport to the next step of heat curing is possible without any component fixation.

The irradiation times as well as curing temperatures and times are product-specific and can be drawn from the respective Technical Data Sheet. When selecting the lamp, it is essential to consider the emission spectrum. DELO® offers a lamp range adapted to the adhesives. The intensity at the adhesive must be determined by means of the DELOLUXcontrol light intensity meter at regular intervals.

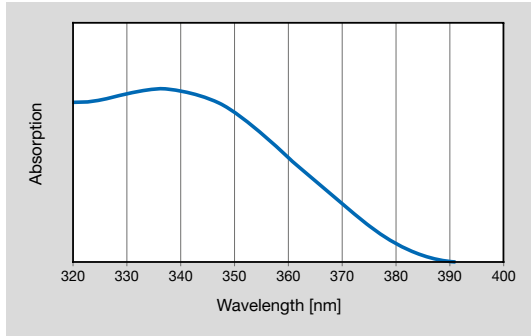
The curing speed of the specific products can be varied through the parameters lamp type, lamp intensity, lamp distance, irradiation time as well as adhesive quantity, temperature and heat curing time. Adhesive containers and dispensing tips must be protected or shielded against UV and visible light. In order to obtain reproducible process results, these parameters must be kept consistent in production. The heating time of the components must be added to the curing time. Reaching of the curing temperature depends on the geometry and the material of the components to be joined. Heating can proceed in air convection ovens, with IR transmitters, or with other suitable heat sources. It must be ensured that the adhesive must have the curing temperature. If the temperatures used for curing are below the temperature ranges specified in the Technical Data Sheet, curing is decelerated, or the product will not completely cure.

When bonding large areas, tensions during the heating, curing and cooling phases (for example by tempering) must be avoided.

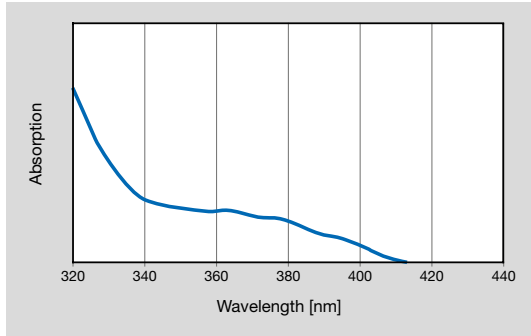
The curing parameters specified in the technical data sheet are determined according to DELO Standards with specified methods, devices and specimens.

Polymerization of the adhesive is an exothermic reaction. When using very large adhesive quantities, the heat released during this reaction may damage the component or the adhesive.

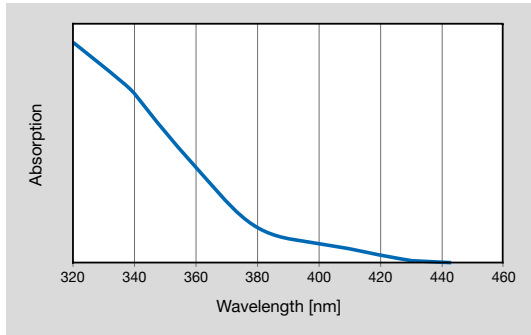
## Wavelength ranges



Absorption spectrum of a photoinitiator (wavelength range from 320 to 400 nm)



Absorption spectrum of a photoinitiator (wavelength range from 320 to 440 nm)



Absorption spectrum of a photoinitiator (wavelength range from 320 to 460 nm)

You can draw the recommended wavelengths from the product-specific technical data sheets.

## Troubleshooting

Perfect bonding results require the maintenance of ideal processing parameters. In case of deviations, the results achieved may also be accordingly unsatisfactory. The following chart gives an overview of errors which may occur when using these products and it provides information on possible causes and remedies. If you have any other questions about how to use our products, please feel free to directly contact our application experts.

| Error pattern                                     | Error  | Possible cause   | Remedies  |
|---|--|--|---|
| Insufficient adhesion                             | Changed component surface                                    | Inhibition of the adhesive due to basic component surface                              | Neutralize or dry the component surface   |
|   | Contamination  | Contamination by oils, greases, silicones, dust, etc.                                  | Remove the cause of contamination<br>Clean the surface                            |
| Changed wetting behavior                          | Changed viscosity  | Adhesive too cold or too warm  | Warm up the adhesive  |
|   |  | Storage life of the adhesive exceeded  | Use the products within their storage life  |
| Incomplete curing                                 | Changed component surface                                    | Changed surface properties (e. g. due to dissimilar material batches, suppliers, etc.) | Adapt the dispensing parameters; restore the original condition of the components |
|   |  | Temperature input during heat curing too low   | Too low curing temperature<br>Adjust the curing temperature                       |
| Incomplete curing                                 | Decrease in reactivity of the adhesive                       | Too short curing time  | Adjust the curing time  |
|   |  | Storage life of the adhesive exceeded  | Use the products within their storage life  |
| Only for blistered cartridges: Changed properties | E. g. reduced adhesion, changed glass transition temperature | Inhibition of the adhesive due to basic component surface                              | Neutralize or dry the component surface   |
|   |  |  | Too long exposure to humidity   |

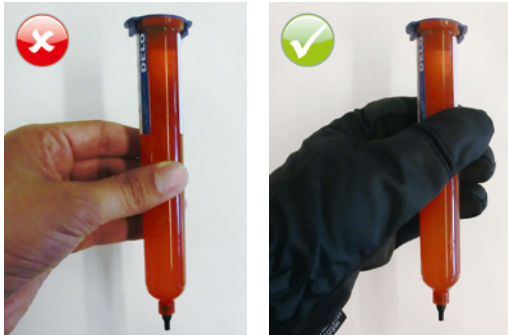
## Instructions and advice for occupational health and safety

See Material Safety Data Sheet.

Skin and eyes must be protected against UV radiation or glare of the lamp. A respective screening of the lamp by means of yellow-colored plastic or gray glass and colored safety glasses (e. g., green or brown) is recommended for eye protection.

## Storage

After delivery, remove the package from the transport packaging and condition to the storage temperature in unopened condition for at least 4 h.



Please make sure that frozen container is only minimally touched as large temperature difference between container and adhesive may lead to the adhesive becoming “detached” from the inner cartridge wall. It is recommended that the container is removed at its rear end or thermally insulating gloves are used.

Storage life and storage temperature can be drawn from the technical data sheet.

The product may be stored in the unopened original container only.

The container must not be exposed to direct solar radiation. This may lead to an unintended decrease in reactivity or even curing.

**Innen/Inside**

**DELO**

Instructions for cooled package (0°C – +10°C)  
How to handle cooled DELO adhesives after arrival

1. Unpacking  
Unpack the adhesive

2. Storage  
Store in a fridge at 0°C to +10°C for at least 4 hours prior to step 3

3. Conditioning  
Allow the adhesive to adjust to room temperature prior to use

1. 拆開外包裝  
取出裝有脫水的紙筒

2. 儲存  
放入第三步驟，請在 0 – +10°C 冷藏室中至少儲存 4 小時

3. 回溫  
使用前，請將脫水的溫度恢復至室溫 (+23°C)

Handling of cooled package +32 °F to +50 °F (0 °C to +10 °C) storage

**Innen/Inside**

**DELO**

Instructions for frozen package (-18°C)  
How to handle frozen DELO adhesives after arrival

1. Unpacking  
Unpack the adhesive

2. Storage  
Store in a freezer at -18°C in unopened box for at least 4 hours prior to step 3

3. Conditioning  
Allow the adhesive to adjust to room temperature prior to use

1. 拆開外包裝  
取出裝有脫水的紙筒

2. 儲存  
放入第三步驟，請將紙筒密封不動在 -18°C 冷凍室中至少儲存 4 小時

3. 回溫  
使用前，請將脫水的溫度恢復至室溫 (+23°C)

Handling of dry ice package -0.4 °F (-18 °C) storage

**Innen/Inside**

**DELO**

Instructions for frozen package (-40°C)  
How to handle frozen DELO adhesives after arrival

1. Unpacking  
Unpack the adhesive

2. Storage  
Store in a freezer at -40°C in unopened box for at least 4 hours prior to step 3

3. Conditioning  
Allow the adhesive to adjust to room temperature prior to use

1. 拆開外包裝  
取出裝有脫水的紙筒

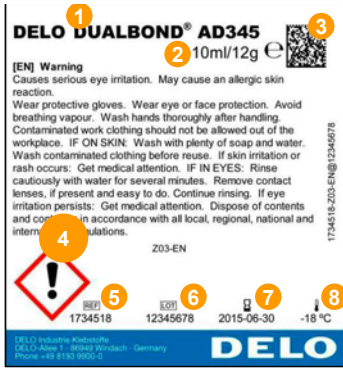
2. 儲存  
放入第三步驟，請將紙筒密封不動在 -40°C 冷凍室中至少儲存 4 小時

3. 回溫  
使用前，請將脫水的溫度恢復至室溫 (+23°C)

Handling of dry ice package -40 °F (-40 °C) storage

# Label

Typical design of a GHS label at DELO. Depending on the container size, the design and content of the label may vary.



- 1 Produktname
- 2 Gebindeinhalt (Volumen/Gewicht)
- 3 Datamatrix  
Erweiterte Artikelnummer@Charge@Haltbarkeit@Produktname  
(1734518-Z03-EN@12345678@2015-06-30@DELO DUALBOND AD345)
- 4 GHS-Kennzeichnung
- 5 Artikelnummer
- 6 Chargennummer
- 7 Mindesthaltbarkeitsdatum
- 8 Lagertemperatur

# CONTACT

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Headquarters

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- **Japan** · Yokohama
- **Malaysia** · Kuala Lumpur
- **Singapore**
- **South Korea** · Seoul
- **Taiwan** · Taipei
- **Thailand** · Bangkok
- **USA** · Sudbury, MA

[www.DELO-adhesives.com](http://www.DELO-adhesives.com)

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07/19

ADHESIVES

DISPENSING

CURING

CONSULTING

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