

DELO

Instructions for Use &
General Information
on the Product Group

DELO-DUOPOX®

Two-component, **light-fixable**
epoxy resin adhesives and encapsulants



Areas of use

DELO-DUOPOX® DB products are two-component epoxy resins that usually cure at room temperature after mixing the two components. Prefixation by means of a light source is possible. They are predominantly used as adhesives and casting compounds in electronics, electrical engineering, automotive, mechanical engineering and tool construction.

DELO-DUOPOX® DB products are filled and delivered in black cartridges or in opaque containers. Samples are filled in double chamber cartridges and can be easily mixed and dispensed by means of a dispensing gun and static mixing tubes. DELO supplies suitable mixing tubes we also use in internal development and testing. In order to protect the adhesive in the mixing tube from room lighting and scattered light, the mixing tube should be enclosed in a housing.

Preparation of the components to be bonded

The contact surfaces must be dry, free of oil, grease and other contaminations in order to achieve optimal bond strength.

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. You can find further information in the written information on surface pretreatment.

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

Processing from open containers/hobbocks

Preparation of the adhesive

The products are usually supplied ready for use. If the products are stored above or below room temperature, it must be ensured that the container is conditioned to room temperature before use. The containers are conditioned at room temperature (max. +25 °C). Heat addition is not permissible. Condensation water on the substrate should be prevented.

The adhesive must be protected from room lighting and scattered light from the environment to prevent premature and undefined light curing as this could already cause initial reactions in the adhesive.

Before mixing, the components of some adhesives that contain fillers must be homogenized. Details can be found in the Technical Data Sheets.

Processing

Two-component products consist of component A and B, which produce the ready-to-use adhesive only after careful and homogeneous mixing in the correct ratio. Therefore, the two-component products are offered as a set of both components with matched fill quantity and one single batch number. The data sheet and specification

values are exclusively determined with components of the same batch and are only valid in this combination.

Opened containers with DELO-DUOPOX® DB must be used up within a maximum of 4 weeks (surroundings: +23 °C, max. 50 % rel. humidity). It must be ensured that the stored adhesive is light-, air- and humidity-tight (e.g. by the barrel follower plate on the supplied container) to prevent entering of air and humidity. Removal from the barrel press, reclosing and later reuse is not intended.

Manual processing

Due to the exothermal curing reaction, large preparations should be mixed in several portions or flat vessels for a better heat dissipation.

Weigh out the components A and B in the mixing ratio indicated. Mix the mixture properly, that means free of streaks, in a suitable vessel. It must be ensured that no air is stirred into the adhesive and that all ingredients weighted out are mixed to a homogeneous preparation. The adhesive must be protected from room lighting and scattered light from the environment to prevent premature and undefined light curing as this could already cause initial reactions in the adhesive.

Processing, i.e. mixing and dispensing must be completed within the processing time specified. Scrapers or notched trowels are suitable for application.

Processing from hobbocks with in-liners

Procedure

- a) Twist in projecting product foil and cut it off just above the fill level



- b) Cut off the product foil at the edge of the hobbock



- c) Then put the edge inwards



- d) Insert the follower plate

System configuration

The configuration of the system must be checked for the individual application. Before use, single products containing a filler that might sediment, must be homogenized through appropriate measures (e. g. storage tank with stirring element) within the processing time specified above.

During maintenance work, product exchange, etc. on dispensing systems, we recommend exchanging the media-carrying supply lines instead of cleaning or rinsing them.

Please check the media-carrying parts, such as dispensing valves and product hoses, for compatibility with the adhesive or the components. Suitable materials predominantly include stainless steel and common plastics, such as PE, PP, PUR or PTFE. When choosing the material, the compatibility with epoxy resins and liquid amines must be verified. We do not recommend using ignoble metals, copper and its alloys (e. g. Zn, Ni, Cu, Fe).

When using cleaning agents, please note our indications for substances compatible with the specific adhesive. You can find more details in the technical information about cleaning agents.

After adhesive application, the components are to be joined and possibly fixed speedily as curing 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 curing reaction. Adhesive containers, mixing tubes 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**.

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

Processing from double chamber cartridge systems



Video instructions for the setup of your device

www.delo.de/login

User: **instduopoxpur** Password: **5F9QedT8**



The adhesives are applied by means of manual or pneumatic dispensing guns. Depending on adhesive, container and viscosity, a minimum dispensing pressure is required to completely empty the cartridge.

Direct pressurization of the cartridge is not recommended. Air may penetrate the adhesive past the piston. This can result in imprecise dispensing results and even air bubbles in the dispensed adhesive.

1. Insert double chamber cartridge in dispensing gun
 - Push the securing lever of the dispensing gun upwards
 - Insert the cograil from ahead to the end stop (cogging down)
 - Open the dispensing gun by flipping the cartridge retainer upwards
 - Insert double chamber cartridge
 - Close the cartridge retainer for cartridge arrangement
2. Equalize fill level deviations
 - Remove the end cap from the cartridge top by turning
 - Equalize fill level deviations by operating the trigger lever (disposal according to MSDS)
 - The double chamber cartridges are overfilled beyond the adhesive amount specified so that no loss occurs while equalizing the fill level deviations
3. Attach mixing tube
 - Attach the mixing tube and lock it by a quarter turn, or lock swivel nut by a quarter turn
4. Avoid mixing errors
 - Before use, abandon one content of the mixing tube in order to prevent mixing errors and ensure perfect adhesive curing (disposal according to Material Safety Data Sheet)
5. Adhesive application
 - Apply the homogeneously mixed adhesive to the component



After work finish or during breaks, the mixing tube can usually remain on the cartridge as closure instead of the original closure cap.

If the processing pauses are shorter than the processing time of the 3 g preparation of the specific product, the same mixing tube can be used again.

Before processing continues, the previous mixing tube is removed, the outlet at the cartridge is ridged of possibly cured adhesive, and a new mixing tube is attached. When replacing the cartridge, we recommend that a new mixing tube is used in any case.

Double chamber cartridges are designed for being used in suitable dispensing guns (e.g. DELO-XPRESS series). The mixing tube should be mounted directly on the outlet of the cartridge.

It is the user's responsibility to test the suitability of the selected dispensing equipment with the original product under close-to-production conditions.

After adhesive application, the components are to be joined and possibly fixed speedily as curing 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 curing reaction. Adhesive containers, mixing tubes 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**.

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

Curing

The adhesives usually cure at room temperature. After mixing the components, the period of time available for processing the product starts. In addition, the mixed and dispensed adhesive can be light-fixed. Complete curing by light is not possible. Adhesive that has not been reached by light cures completely at room temperature or accelerated by heat due to the 2C mechanism.

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 curing 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 reaction of the aminic DELO-DUOPOX® DB adhesives is significantly influenced by irradiation parameters, adhesive quantity, temperature and duration of the curing step. In order to obtain reproducible process results, these parameters must be kept consistent in production. The curing parameters specified in the Technical Data Sheet are determined according to DELO Standards with specified methods, devices and specimens.

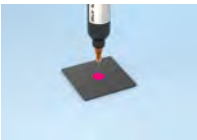
The wavelengths suitable for fixation are listed in the specific Technical Data Sheets of the products.

During curing, exothermic reaction heat is generated. This depends on the adhesive and the adhesive quantity. After exceeding the processing time, the viscosity increases fast until complete curing resp. hardening. Temperatures below room

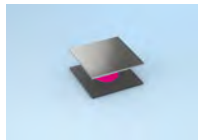
temperature decelerate curing. In extreme cases, the product cures incompletely or not at all. Curing conditions deviating from room temperature can influence the product properties. Complete curing of most products is achieved at room temperature after 24 hours to 7 days. The curing time of products which are basically room-temperature-curing can be reduced by increasing the temperature to a maximum of +120°C.

Production flow for bonding components without light fixation:

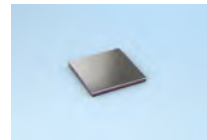
1. Preparation of the adhesive and the components
2. Mixing of the adhesive
3. Adhesive application to one component
4. Timely joining of the components
5. Curing of the adhesive at room temperature or by heat addition



Adhesive application



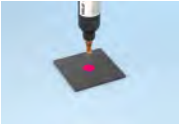
Joining



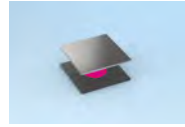
Complete curing at room temperature or by additional heat input

Production process when bonding components by light fixation:

1. Preparation of the adhesive and the components
2. Mixing of the adhesive
3. Adhesive application to one component
4. Timely joining of the components
5. Light fixation of the components by exposure to UV or visible light in the necessary wavelength range.
6. Curing of the adhesive at room temperature or by heat addition



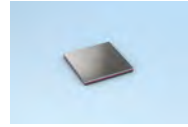
Adhesive application



Joining



*Light fixation
e. g. at the fillet*



Complete curing at room temperature or through additional heat input

Light fixation of adhesive subareas, for example the fillet, can cause initial strength of the joined connection, so transport to the next process steps is possible without any component fixation. Final curing takes place at room temperature or accelerated by heat due to the 2C mechanism.

You can find the detailed, product-specific information on the processing of each product in the specific Technical Data Sheet.

Instructions and advice for occupational health and safety

Pay attention to the details provided in the Material Safety Data Sheet of the specific product and the hazard symbols on the labels of the adhesive containers.

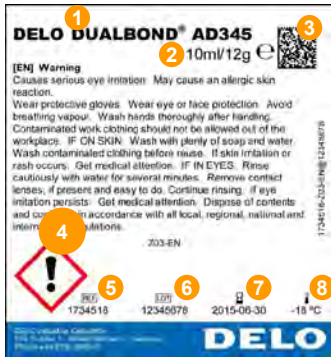
Skin and eyes must be protected against ultraviolet light, glare of the lamp, possible reflections and scattered light. Complete shielding of the emissions by suitable optical filters is recommended. If the light source is not completely shielded, suitable clothing for eye and skin protection must be worn. Please contact your safety officer for further details.

Storage

Storage life and storage temperature can be drawn from the Technical Data Sheet. The product may be stored in the unopened original container only.

Label

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



- 1** Product name
- 2** Container content (volume/weight)
- 3** Datamatrix
Extended article number@Batch@Expiry date@Product name
(1734518-Z03-EN@12345678@2015-06-30@DELO DUALBOND AD345)
- 4** GHS labeling
- 5** Article number
- 6** Batch number
- 7** Expiry date
- 8** Storage temperature

CONTACT

DELO Industrial Adhesives
Headquarters

► **Germany** · Windach/Munich

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

..... www.DELO-adhesives.com



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.

© DELO® – This document including any and all parts is protected by copyright. Any use not expressly permitted by the Urheberrechtsgesetz (German Copyright Act) shall require DELO®'s written consent. This shall apply without limitation to reproductions, duplications, disseminations, adaptations, translations and microfilms as well as to the recording, processing, duplication and/or dissemination by electronic means.

06/20

ADHESIVES

DISPENSING

CURING

CONSULTING

DELO