Application areas

DELO-DUOPOX adhesives, casting resins and trowelling compounds are two-component epoxy resins that usually cure at room temperature after mixing the two components (information about purely heat-curing DELO-DUOPOX products see p. 6 et seq.). They are predominantly used as adhesives and casting compounds in electronics, electrical engineering, automotive, aircraft construction, mechanical engineering and tool construction.

Many DELO-DUOPOX products are filled in DELO-AUTOMIX double chamber cartridges and can be easily mixed and dispensed by means of a dispensing gun and static mixing tubes. These products are suitable for the use in the entire industry. DELO supplies suitable mixing tubes we also use in internal development and testing.

The mixing tube B050 is only conditionally suitable for our DELODUOPOX rapid adhesives. You can find further information in the DELO-AUTOMIX selection chart and instructions for use (see page 1).
Preparation of the components to be bonded

The contact surfaces must be free of oil, grease and other contaminations in order to achieve optimal bond strength. We provide our DELOTHEN cleaners. You can find more details in the “DELOTHEN Cleaners” technical information.

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.

Preparation of the adhesive

The adhesives are usually supplied ready for use. If the products are stored above or below room temperature, it must be ensured that the containers are conditioned to room temperature before use. The containers are conditioned at room temperature (max. +25 °C). Heat addition is not permitted. The conditioning time of a tube is approx. 0.5 h. The conditioning time depends on the container size and the storage temperature. You can find detailed information in the specific Technical Data Sheet. Condensation water on the substrate must be prevented.

Special DELO-DUOPOX products must be homogenized by tumbling before use (see Technical Data Sheets or information provided on the containers).

Processing from DELO-AUTOMIX cartridges

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 closing 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 rid 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.

It is the user’s responsibility to test the suitability of the dispensing equipment with the original product under close-to-production conditions.
Processing from open containers/hobbocks

Preparation of 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

2-component products consist of the components A and B producing the ready-made adhesive only after proper, homogeneous mixing in the correct ratio. Therefore, the 2-component products are offered as a set of both components with matched fill quantity and one single batch number. The values of the Data Sheet and the Specification were determined with components of the same batch and therefore are only applicable to this combination.

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 in and all weighed ingredients are mixed homogeneously. Processing, i.e. mixing and dispensing must be completed within the processing time specified. Scrapers or notched trowels are suitable for application. In case of lathing or milling, the depth of cut and the processing speed should be possibly low in order to achieve a high dimensional stability.

Procedure

Per component:
1. Remove cover
2. When using in-liners: Open aluminum bottom bag
   a) Turn it and cut a cross of approx. 10 cm. Afterwards, insert the feeding pipe through the cross cut or
   b) Cut open the product foil and put it around the hobbock
3. Insert follower plate

Opened containers with DELO-DUOPOX 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 hermetically closed (e.g. by the barrel follower plate on the supplied container) to prevent entering of air and humidity. Reclosing and later reuse is not intended.

Products containing a filler that might sediment, must be homogenized through appropriate measures before use (e.g. tumbling in the supplied container) and kept homogeneous within the above processing time (e.g. storage tank with stirring element). Details can be found in the Technical Data Sheets.

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

Please check the product-guiding parts, such as dispensing valves and product tubes, 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 non-ferrous metals, copper and its alloys (e.g. Zn, Ni, Cu, Fe).

When using cleaners, please note our indications for substances compatible with the specific adhesive.

Curing

The adhesives usually cure at room temperature. After mixing the components, the period of time available for processing the product starts. During curing, exothermic reaction heat is generated. This temperature depends on the product and on the product 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.

Certain products require an additional tempering process or heat curing (see the respective Technical Data Sheet).

Complete curing of most products is achieved at room temperature after 24 hours to 7 days. The curing time can be reduced by increasing the temperature to a maximum of +120 °C.

You can find the detailed, product-specific information on the processing of each product in the specific Technical Data Sheet.
Additional processing recommendations for heat-curing encapsulants

DELO-DUOPOX VE 7xxxx
DELO-DUOPOX CR7xx
DELO-DUOPOX CR87xx

Product details and application areas

These products are heat-curing, filled, two-component epoxy casting resins suitable as multi-purpose encapsulants or potting materials.

Application areas include casting applications in aircraft construction, mechanical engineering, tool construction, electrical engineering and electronics.

The products are characterized by excellent media and temperature resistance, normally in a temperature range from -60 °C to +180 °C. Depending on the application, other limits may be applicable.

The encapsulants show a low exothermic reaction. Therefore, they are suitable for large preparation quantities or casting volumes per component. They were specifically developed for being processed on 2C dispensing systems (see figure below).

Preparation of the components to be bonded

The surfaces to be bonded must be dry, free of dust and grease, and free of other contaminations.

In order to prevent damage to the seals, we recommend that a suitable cleaner is selected in consultation with the system manufacturer.

Additional information on processing

Preparation of the adhesive

Component A and B must homogeneously be mixed according to the mixing ratio specified in the Technical Data Sheet.

Filler sedimentation is possible. Therefore, it is reasonable to stir the single components before use and circulate them if necessary.

Not every application requires preheating of the single components. Depending on the flow behavior, these can however be heated to +50 °C.

Possible bubble formation during homogenization or mixing can clearly be reduced by using a processing system with vacuum unit (during preparation and/or dispensing).

Adhesive application/joining

When the adhesive has been applied, processing should continue quickly as adhesives on the basis of anhydrides are sensitive to hydrolysis in uncured condition due to their chemical nature.

Too long exposure to humidity may influence the properties that can be achieved, such as adhesion or glass transition temperature.

Larger areas and thick layers are particularly critical. Due to the large surface/volume ratio, much humidity can be absorbed within a short period of time.

System configuration

The system configuration must be checked for the individual application.
Curing

Curing proceeds after homogeneous mixing of component A and B at a temperature of +150 °C in 20 minutes plus heating time of the components. The heating time depends on the component size and the oven type.

The minimum curing temperature is +130 °C.

The maximum curing temperature is +180 °C.

The actual curing times at the specific temperatures depend on the heating time of the components, which must be added to the curing time of the adhesive.

You can find further details about processing and curing in the specific Technical Data Sheet.

Instructions and advice for occupational health and safety

See Material Safety Data Sheet

Storage

In unopened original container

Storage life: see Technical Data Sheet

CONTACT