Application areas

DELO® MONOPOX products with cationic polymerization are predominantly used in semiconductor packaging, microelectronics, electrical engineering, optoelectronics, organic electronics, automotive, and hard disk drives for bonding, sealing, coating, fixing and casting. DELO® MONOPOX products are one-component, heat-curing products.
Preparation of the components to be bonded

For optimal bond strength, the surfaces to be bonded must be free of humidity, oil, grease, separating agents and other contaminations. Our DELOTHEN cleaners are available for this purpose. The Technical Information “DELOTHEN Cleaners” provides more details.

When using alkaline cleaners, a neutralization of the cleaned surface must be ensured. Alkaline surfaces can inhibit adhesive curing, resulting in poor or even no establishment of adhesion at all.

In addition to wet-chemical cleaning, adhesion can be further improved by a suitable chemical and physical surface pretreatment. For more details, please refer to the Technical Information “Surface Pretreatment”.

It is advantageous to preheat the two components for reducing condensation or surface humidity. Furthermore, a warm surface can improve establishment of adhesion to the surface, and therefore reduce the time until functional strength is achieved.

Preparation of the adhesive

The products are usually supplied ready for use. In case of cool storage, the containers must be conditioned to room temperature before use to prevent condensation during adhesive application. Heat addition during conditioning is not permitted. The conditioning times depend on the container size and the storage time. You can find details about preparation of the products in the specific Technical Data Sheet.

Processing

After conditioning to room temperature, the products can be directly applied from the container or with a dispensing system. All parts in contact with the product must be cleaned thoroughly with e.g. DELOTHEN EP or acetone before use.

We recommend dispensing from the original container. If adhesive must be refilled due to system-related circumstances, it must be ensured that the adhesive does not get contaminated by foreign substances or humidity.

DELO® MONOPOX adhesives are intended to be used at temperatures between +64 and +77 °F (+18 and +25 °C) and a relative air humidity between 20 to 65 % (normal room climate). So far, we have not made any negative experience as to processing under these room temperature and air humidity conditions. The products could be processed very well under laboratory conditions, and no impairment of the processing properties could be recognized.

Dispensing valves and product-bearing elements must be carefully cleaned before use, residues of products must be completely removed. DELOTHEN EP as well as acetone are recommended to remove DELO® MONOPOX residues.

Stainless steel, PE, HDPE, PP and PTFE are suitable materials for product-bearing elements. It is not recommended to use PU, silicone and non-ferrous metals.

You can draw detailed information about how to handle the products from the specific Technical Data Sheet.

Curing of the adhesive layer

The curing temperatures and times are product-specific and can be found in the appropriate Technical Data Sheet. The heating time of the components must be added to the curing time.

Heat addition during conditioning is not allowed.

Heating can proceed in air convection ovens, with IR transmitters, or with other suitable heat sources, e.g. thermodes or induction. The curing temperature must be reached at the adhesive. If the temperatures used for curing are below the temperature ranges specified in the Technical Data Sheet, curing is decelerated, or the product cures incompletely or not at all.

The adhesive must not be heated beyond the maximum curing temperature specified in the Technical Data Sheet. When bonding large areas, tensions during the heating, curing and cooling phases (for example by tempering) must be avoided.

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

Open bonding, coating, sealing or casting

1. Preparation of the adhesive and the components
2. Adhesive application
3. Complete curing by heat

Bonding of components

1. Preparation of the adhesive and the components
2. Adhesive application
3. Joining
4. Complete curing by heat
Trouble-shooting

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.

<table>
<thead>
<tr>
<th>Error pattern</th>
<th>Error</th>
<th>Possible cause</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient</td>
<td>Changed component surface</td>
<td>Inhibition of the adhesive due to alkaline</td>
<td>Neutralize or dry the component surface</td>
</tr>
<tr>
<td>adhesion</td>
<td></td>
<td>component surface</td>
<td></td>
</tr>
<tr>
<td>Contamination</td>
<td></td>
<td>Contamination by oils, greases, silicones, dust,</td>
<td>Remove the cause of contamination, clean the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>etc.</td>
<td>surface</td>
</tr>
<tr>
<td>Changed wetting</td>
<td>Changed viscosity</td>
<td>Adhesive too cold or too warm</td>
<td>Warm up the adhesive</td>
</tr>
<tr>
<td>behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible sedimentation of the filler (see TDS)</td>
<td>Tumble the container or homogenize the adhesive by a stirring element in the tank</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Storage life of the adhesive exceeded</td>
<td>Use the products within their storage life</td>
</tr>
<tr>
<td>Changed component</td>
<td>Changed surface properties</td>
<td></td>
<td>Adapt the dispensing parameters; restore the original condition of the components</td>
</tr>
<tr>
<td>surface</td>
<td>(e.g. due to dissimilar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>material batches, suppliers, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomplete curing</td>
<td>Temperature input during heat</td>
<td>Too low curing temperature</td>
<td>Adjust the curing temperature</td>
</tr>
<tr>
<td></td>
<td>curing too low</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Too short curing time</td>
<td>Adjust the curing time</td>
<td>Readjust the irradiation time</td>
</tr>
<tr>
<td></td>
<td>Decrease in reactivity of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>adhesive exceeded</td>
<td>Storage life of the adhesive exceeded</td>
<td>Use the products within their storage life</td>
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<td></td>
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<tr>
<td></td>
<td>component surface</td>
<td>component surface</td>
<td></td>
</tr>
</tbody>
</table>

Instructions for use: DELO® MONOPOX cationic

Instructions for use: DELO® MONOPOX cationic

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.

Storage

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

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

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

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 storage temperature specified in the Technical Data Sheet must not be undershot.
Label

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

Instructions for use: DELO® MONOPOX cationic
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.

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