

DELO® MONOPOX AC2451

Anisotropic conductive, heat-curing adhesive to contact flip chip

Base

- modified epoxy resin
- one-component, heat-curing, solvent-free, filled

Use

- for the bonding and electrical contacting of bare semiconductors (ICs) in flip-chip technology
- especially suitable for the smart card and smart label sector
- optimized for high mechanical stress e.g. during the converting process
- fast curing at moderate temperatures (+150 to +210 °C at the adhesive)
- low water absorption and, therefore, high reliability in the test +85 °C / 85 % relative humidity
- the storage temperature may not fall below -21 °C
- very good adhesion to PET, FR4, copper, aluminum and silver
- the cured product is normally used in a temperature range of -40 °C to +150 °C; depending on the application, other limits may be more reasonable
- compliant with RoHS directive 2015/863/EU
- halogen-free according to IEC 61249-2-21

Processing

- the adhesive is supplied ready for use, in case of cool or refrigerated storage, it must be ensured that the container is conditioned to room temperature before use
- the containers are conditioned at room temperature (max. +25 °C); the conditioning time is approx. 0.5 h for containers up to 10 ml; additional heat addition is not allowed
- the adhesive is applied by dispensing, stencil printing or jetting
- the process steps for the adhesive application are as follows:
 1. Application of adhesive to the substrate. It must be ensured that the adhesive layer is bubble-free.
 2. Placement of the semiconductor into the adhesive.
 3. Pressing of the semiconductor with defined parameters (contact pressure, pressing time and temperature at the adhesive) by means of a thermode.
- the surfaces to be bonded must be dry as well as free of dust, grease and other contaminations

Curing

- curing proceeds, e. g., at temperatures between +150 and +210 °C at the adhesive in 6 to 19 seconds using a thermode
- increased temperatures shorten the curing process, lower temperatures extend it, and can change the properties of the cured product
- the minimal curing temperature is +100 °C, for thermode process +150 °C
- the actual curing times at the respective temperatures are dependent on the heating time of the components, the heating time of the components must be added to the curing time of the adhesive
- the curing times of the adhesive at the curing temperatures recommended can be drawn from the technical data

Technical data

<i>Color</i>	grey
particle	Ni compound
Particle size [μm] d50	5.3
Density [g/cm^3] DELO Standard 13 at room temperature (approx. 23 °C)	1.45
<i>Viscosity</i> [mPas] at 23 °C, rheometer, shear rate 10 1/s	39000
Curing time with thermode [s] at +180 °C adhesive temperature	8
Curing time with thermode [s] at +200 °C adhesive temperature	6
Die shear strength [MPa] DELO-Norm 30 Curing: 8 s at +190/180 °C substrate: Toyo Al/PET antenna Si-chip 0.4 x 0.4 mm with Au-bumps after 24h at room temperature (max. 25 °C)	68
Young's modulus [MPa] at 25 °C, DMTA	4100
Shore hardness D according to DIN EN ISO 868 after 20 min at +140 °C	85
Glass transition temperature [°C] DMTA	144
Coefficient of linear expansion [ppm/K] TMA, DELO Standard 26 in a temperature range of +30 °C to +100 °C	60
Coefficient of linear expansion [ppm/K] TMA, DELO Standard 26 in a temperature range of +120 °C bis +180 °C	180
Shrinkage [%] DELO Standard 13 curing: 20 min at +140 °C	0.4
Water absorption [weight %] according to DIN EN ISO 62 after 40 min at +140 °C	0.3

<i>Ion content Na+</i> extraction	<10
<i>Ion content K+</i> extraction	<10
<i>Ion content Cl-</i> extraction	<10
<i>Ion content F-</i> extraction	<10
Storage life at room temperature (max. 25 °C) in unopened original container	4 days
Storage life at -18 °C in unopened original container	6 months

Instructions and advice

General

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.

Instructions for use

The instructions for use of DELO MONOPOX are available on: www.DELO.de. We will be pleased to send them to you on demand.

Occupational health and safety

see material safety data sheet

Specification

The properties in italics are part of the specification. Ranges with clear limits are defined for them and others, where applicable. In the course of the QA test, each batch is tested for these properties and the maintenance of the limits is ensured. The measuring methods used can deviate from those specified in the data sheet. Details can be found in the QA test report.