

# mCD Adhesives

(mCD = modified polycarbamin acid derivate)

Product group/curing class	DELO DUALBOND <small>UV-/ heat-curing</small>				DELO MONOPOX <small>heat-curing</small>			
	AD340	AD345	IC343	LT354	AC365	DA358	DA375	DA376
Product code								
Low curing temperature	✓	✓	✓	✓	✓	✓	✓	✓
Thermally/electrically conductive			✓		✓		✓	
Color	beige	beige	silver gray	dark gray	brown	beige	gray	black
Filler	unfilled	15 % minerals	70 % silver	15 % minerals	10 % gold-plated nickel	10 % quartz	75 % silver	unfilled
Viscosity [mPas]	12,000	30,000	30,000	75,000	40,000	30,000	39,000	25,000
Flexibility	low	low	low	medium	low	medium	low	high
Light fixation time [s]	< 5	< 5	< 5	< 5	–	–	–	–
Curing temperature [°C]	min.	+80	+80	+80	+80	+80	+80	+100
	max.	+100	+100	+150	+100	+170	+180	+180
Curing with thermode	–	–	–	–	5 s @ +150 °C	5 s @ +150 °C	8 s @ +150 °C	8 s @ +150 °C
Curing with convection oven	10 min @ +100 °C 15 min @ +90 °C 30 min @ +80 °C	10 min @ +100 °C 20 min @ +90 °C 30 min @ +80 °C	10 min @ +100 °C 15 min @ +90 °C 30 min @ +80 °C	10 min @ +100 °C 20 min @ +90 °C 30 min @ +80 °C	1 min @ +140 °C 5 min @ +130 °C 10 min @ +120 °C	1 min @ +140 °C 10 min @ +100 °C 30 min @ +80 °C	2 min @ +175 °C 8 min @ +150 °C 30 min @ +80 °C	– 2 min @ +130 °C 5 min @ +100 °C
Young's modulus [MPa]	400 DIN EN ISO 527	190 DIN EN ISO 527	on request	500 DIN EN ISO 527	1,500 DIN EN ISO 527	1,300 DIN EN ISO 527	3,800 DMTA at rt	25 DMTA at rt
Glass transition temperature T <sub>g</sub> [°C]	+75 TMA	+85 TMA	on request	+80 TMA	+75 TMA	+45 TMA	+80 TMA	–40 DMTA
Water absorption [%] <small>24 h at room temperature</small>	0.5	0.3	0.2	0.25	0.5	0.4	0.5	2.4
Decomposition temperature [°C]	245	215	250	260	230	230	260	230
Shrinkage [vol. %]	3.1	3.2	2.2	2.4	2.7	3	3.4	1.2
Elongation at tear [%]	4	9	on request	20	2.4	23	3	300
Resistivity [Ωcm]	non-conductive	non-conductive	1.4 × E–4	non-conductive	n. d.	non-conductive	1.4 × E–04	non-conductive
Processing time at room temperature	72 h	72 h	72 h	48 h	72 h	72 h	48 h	48 h
Storage life at –18 °C	6 months	6 months	6 months	6 months	6 months	6 months	4 months	6 months
Halogen-free <small>by the criteria of IEC 61249-2-21</small>	✓	✓	✓	✓	✓	✓	✓	✓
Special features of product	extremely fast fixing strength very consistent shrinkage optimized for highly precise optical bonding	extremely fast fixing strength very consistent shrinkage optimized for highly precise optical bonding	isotropic electrically conductive thermally conductive extremely fast fixing strength	extremely fast fixing strength very consistent shrinkage optimized for highly precise optical bonding	anisotropic electrically conductive optimized for semiconductors, flip-chip, smart card/smart label, temperature-sensitive substrates	very high strength on E130i (LCP)	isotropic electrically conductive thermally conductive optimized for semiconductors, metal leadframes, printed circuit boards, ceramic substrates	fast fixation very flexible/ tension-equalizing reflow-resistant showerhead dispensing possible high die shear strength for die attach/MEMS

n.d. not determined

**AC** = Anisotropic Conductive   **AD** = ADhesive   **DA** = Die Attach   **IC** = Isotropic Conductive   **LT** = Low Temperature

## Product description

DELO DUALBOND mCD products are one-component, solvent-free adhesives which cure by exposure to light and heat.

DELO MONOPOX mCD products are one-component, solvent-free adhesives which cure by exposure to heat.

## Standard temperature range

mCD products are normally used in a temperature range of –40 °C to +130 °C.

Many product properties depend on the temperature and can change permanently, in particular at high temperatures. Therefore, it has to be checked before each use whether a certain adhesive is suitable for the temperatures in the required area of application.

Please see the Technical Data Sheet for more information on how our products react to temperatures.

## Processing

The products are normally delivered ready for use. After conditioning, they are applied directly from the container or using dispensing units.

## Curing

The dual-curing DELO DUALBOND mCD adhesives can be cured by a combination of light and heat or by heat only. In case of prefixation by light of the suitable wavelength, heat curing at temperatures of at least +80 °C is mandatory.

DELO MONOPOX mCD adhesives are heat-curing only. They require temperatures of at least +80 °C for curing.

## Surface pretreatment

To achieve optimum bond strength, the surfaces must be free from dust, oil, grease, separating agents and other contaminations. For cleaning, we recommend using cleaners from the DELOTHEN series.

After cleaning, the adhesion of the adhesive can be further enhanced by sand blasting, grinding or pickling the surface.

## Storage life

After delivery, in the unopened original container: see Technical Data Sheet of the product.

## Use

mCD products are predominantly used for fixing and bonding in microelectronics, electrical engineering and precision engineering. These adhesives are constructional elements. The suitable product is selected according to component material, stress, design and processing technology.

In particular, properties like low curing temperature, consistent shrinkage, very fast light fixation and high strength enable fully automated processes with large production volumes.

## Further information

More type-specific properties are included in the Technical Data Sheets, Material Safety Data Sheets and Instructions for Use.

For application tests and any question you might have regarding the use of DELO products, please do not hesitate to contact our Engineering Department.

## Application examples

- **Very fast fixing strength**
  - DELO DUALBOND AD340
  - DELO DUALBOND AD345
  - DELO DUALBOND IC343
  - DELO DUALBOND LT354
- **Optical bonding, very consistent shrinkage**
  - DELO DUALBOND AD340
  - DELO DUALBOND AD345
  - DELO DUALBOND LT354
- **Dual curing**
  - DELO DUALBOND AD340
  - DELO DUALBOND AD345
  - DELO DUALBOND IC343
  - DELO DUALBOND LT354
- **High flexibility**
  - DELO MONOPOX DA376
- **High thermal conductivity**
  - DELO DUALBOND IC343
  - DELO MONOPOX DA375
- **High electrical conductivity**
  - Isotropic:
    - DELO DUALBOND IC343
    - DELO MONOPOX DA375
  - Anisotropic:
    - DELO MONOPOX AC365
- **Die attach**
  - DELO MONOPOX DA358
  - DELO MONOPOX DA375
  - DELO MONOPOX DA376
- **Thermode curing possible**
  - DELO MONOPOX AC365
  - DELO MONOPOX DA358
  - DELO MONOPOX DA375
  - DELO MONOPOX DA376
- **Halogen-free**
  - All products

## CONTACT

**DELO** Industrial Adhesives  
Headquarters

► **Germany** · Windach / Munich

- **China** · Shanghai
- **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)

Our selection charts/material selection guides are a technical selection aid giving an overview of various product variants. We will be pleased to provide you with sales details, such as available container sizes, stock availability and minimum order quantities, on request. 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 brochure 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. 07/17

ADHESIVES

DISPENSING

CURING

CONSULTING

**DELO**

**DELO**



## SELECTION CHART

mCD Adhesives

**DELO DUALBOND**

Modified polycarbamin acid derivatives  
one-component · UV-/heat-curing

**DELO MONOPOX**

Modified polycarbamin acid derivatives  
one-component · heat-curing