

# DELO<sup>®</sup> KATIOBOND<sup>®</sup> 4670

## modified epoxy resin | 1C | UV-curing

free of solvents | filled, high ion purity | electrically insulating, humidity-resistant, flowable, self-leveling, tension-equalizing

### Special features of product

- compliant with RoHS Directive 2015/863/EU
- halogen-free according to IEC 61249-2-21
- compliant with limits of VOC content in adhesive acc. to GB33372-2020
- passes ANSI/UL 94 HB Flame Test

### Function

- Fill for Dam&Fill
- glob top
- encapsulant / potting compound

### Typical area of use

- smart card applications
- encapsulation of chip modules

### Curing

Suitable lamp types LED 365 nm, UVA

Typical irradiation time

*intensity 55 - 60 mW/cm<sup>2</sup>* 60 s  
*UVA*

*intensity 150 mW/cm<sup>2</sup>* 30 s  
*LED 365 nm*

*at +70 °C*

### Processing

Typical adhesive application needle dispensing

Conditioning time (typical)

*in containers up to 1,000 ml* 6 h

*in containers up to 10 l* 15 h

Processing time

<i>tumble before processing for 3 h   1 – 2 1/min   conditioned containers in containers up to 1,000 ml</i>	24	h
<i>tumble before processing for 6 h   1 – 2 1/min   conditioned containers in containers up to 10 l</i>	24	h

Storage life in unopened original container

<i>at 0 °C to +10 °C</i>	6	month(s)
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**Technical properties**

Color in cured condition in 0.1 mm layer thickness	gray	
Transparency in cured condition in 0.1 mm layer thickness	transparent	
Filler particle type	minerals	
Filler particle size	d98 = 32 µm	
Filler content	43	wt. %

**Parameters**

Density <i>DELO Standard 13   liquid</i>	1.4	g/cm <sup>3</sup>
Viscosity <i>liquid   Viscosimeter</i>	4800	mPa·s
Minimum irradiation time <i>DELO Standard 37   DSC   60 mW/cm<sup>2</sup>   Measuring temperature: 30 °C</i>	9	s
Compression shear strength <i>DELO Standard 5   <b>Glass</b>   <b>AI</b>   60 mW/cm<sup>2</sup>   60 s   Plus   at approx. +23 °C   24 h</i>	10	MPa
Compression shear strength <i>DELO Standard 5   <b>Glass</b>   <b>Glass</b>   60 mW/cm<sup>2</sup>   60 s   Plus   at approx. +23 °C   24 h</i>	20	MPa
Tensile strength <i>Based on DIN EN ISO 527   60 mW/cm<sup>2</sup>   120 s   Plus   at approx. +23 °C   24 h</i>	30	MPa
Elongation at tear <i>Based on DIN EN ISO 527   60 mW/cm<sup>2</sup>   120 s   Plus   at approx. +23 °C   24 h</i>	6	%

Young's modulus <i>Based on DIN EN ISO 527   60 mW/cm<sup>2</sup>   120 s   Plus   at approx. +23 °C   24 h</i>	1700	MPa
Shore hardness D <i>Based on DIN EN ISO 868   60 mW/cm<sup>2</sup>   120 s   Plus   at approx. +23 °C   24 h</i>	79	
Glass transition temperature <i>DMTA   365 nm   150 mW/cm<sup>2</sup>   30 s   Plus   at approx. +23 °C   24 h</i>	55	°C
Coefficient of linear expansion <i>DELO Standard 26   TMA   Evaluation T: 30 °C - 150 °C   60 mW/cm<sup>2</sup>   60 s   Plus   at approx. +23 °C   24 h</i>	150	ppm/K
Shrinkage <i>DELO Standard 13   60 mW/cm<sup>2</sup>   60 s   Plus   at approx. +23 °C   24 h</i>	3	vol. %
Water absorption <i>Based on DIN EN ISO 62   Layer thickness: 2 mm   365 nm   150 mW/cm<sup>2</sup>   30 s   Plus   at approx. +23 °C   24 h   Type of storage: Media   Medium: Distilled water   Duration: 24 h</i>	0.19	%
Decomposition temperature <i>DELO Standard 36   60 mW/cm<sup>2</sup>   60 s</i>	280	°C
Extractable fluoride ions	≤100	ppm
Extractable chloride ions	≤10	ppm
Extractable potassium ions	≤10	ppm
Extractable sodium ions	≤10	ppm
Relative permittivity <i>Based on RF-IV   1 GHz</i>	3.0	
Relative permittivity <i>Based on RF-IV   1 MHz</i>	3.3	
Relative permittivity <i>Based on RF-IV   10 MHz</i>	3.3	
Relative permittivity <i>Based on RF-IV   liquid   100 MHz</i>	3.2	

**Converting table**

°F = (°C x 1.8) + 32	1 MPa = 145.04 psi
1 inch = 25.4 mm	1 GPa = 145.04 ksi
1 mil = 25.4 µm	1 cP = 1 mPa·s
1 oz = 28.3495 g	1 N = 0.225 lb

### **General curing and processing information**

The adhesive can be tumbled during conditioning if necessary, depending on the chemical basis and container size. After tumbling, a waiting time of 1 – 2 h must be maintained to enable air bubbles to escape.

Alternatively, a pressure tank with integrated stirring element can be used to keep the material continuously homogeneous.

The viscosity may decrease during tumbling.

Further information can be found in the instructions for use. The curing time stated in the technical data was determined in the laboratory. It can vary depending on the adhesive quantity and component geometry and is therefore a reference value. Increasing or decreasing the curing temperature and / or irradiation intensity and / or irradiation time shortens or prolongs the curing time and can lead to changed physical properties. All curing or light fixation parameters depend on material thickness and absorption, adhesive layer thickness, lamp type and distance between lamp and adhesive layer. Curing until final strength proceeds within 24 hours at room temperature. High temperatures during or after curing can lead to post-crosslinking of the adhesive which influences the physical properties of the bond. Values measured after 24 h at approx. 23 °C / 50 % r.h., unless otherwise specified.

### **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.

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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**

You can find further details in the instructions for use.

The instructions for use are available on [www.DELO-adhesives.com](http://www.DELO-adhesives.com).

We will be pleased to send them to you on demand.

### **Occupational health and safety**

See material safety data sheet.

**Specification**

Nothing contained in this Technical Datasheet shall be interpreted as any express warranty or guarantee. This Technical Datasheet is for reference only and does not constitute a product specification. Please ask our responsible Sales Engineer for the applicable product specification which includes defined ranges. DELO is neither liable for any values and content of this Technical Datasheet nor for oral or written recommendations regarding the use, unless otherwise agreed in writing. This limitation of liability is not applicable for damages resulting from intent, gross negligence or culpable breach of cardinal obligations, nor shall it apply in case of death or personal injury or in case of liability under any applicable compulsory law.

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