DELO® KATIOBOND® GE680
UV-curing encapsulant, highly viscous

**Base**
- modified epoxy resin
- one-component, solvent-free, UV-curing, thixotropic

**Use**
- especially for the encapsulation of ICs in chip on board technology
- for the encapsulation of chip modules and coating of electronic components
- the system enables extremely short cycle times and, therefore, an increase in productivity and a decrease in production costs
- 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
- tested for biocompatibility and meets the requirements according to USP 30, NF 25, Class VI
- compliant with RoHS directive 2015/863/EU

**Processing**
- the adhesive is supplied ready for use; in case of cool 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 50 ml and approx. 6 h for containers up to 1000 ml; additional heat addition is not allowed
- the adhesive can be applied by dispensing
- the surfaces to be bonded must be dry as well as free of dust, grease and other contaminations
- the postcuring potential of the adhesive decreases if the components are heated to approx. 125 °C directly before irradiation. This procedure can lead to improved reliability values
- when using aqueous cleaners with alkaline properties, they must be removed from the bonding surface after cleaning through appropriate rinsing cycles
- dispensing valves and product-bearing elements must be carefully cleaned before use, residues of other products must be completely removed; acetone or DELOTHEN EP are recommended as cleaners
- for further information please refer to our instructions for use DELO KATIOBOND
**Curing**
- curing with UV light in a wavelength range of 320 – 380 nm. DELOLUX LED curing lamps are especially suitable as per the chart below. All standard DELOLUX HID discharge lamps are also suitable.
- after irradiation curing until final strength within 24 h at room temperature
- increased temperatures accelerate the reaction, lower temperature decelerate it
- increased intensities shorten the required irradiation time, lower intensities prolong it

<table>
<thead>
<tr>
<th>Lamp type</th>
<th>DELOLUX 20 / 50 / 80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength [nm]</td>
<td>365</td>
</tr>
<tr>
<td></td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>460</td>
</tr>
<tr>
<td>Suitability</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

- not suitable  + suitable  ++ especially suitable

**Absorption spectrum**
- photoinitiation system in epoxy resin basic matrix

**Curing parameters**
- dependent on the layer thickness of the encapsulation compound, lamp type and irradiation intensity

**Technical data**

*Color*
cured in a layer thickness of approx. 0.1 mm
milky translucent

cured in a layer thickness of approx. 0.5 mm
milky white

Filler content [weight %]
75

Filler particle size [µm]
≤90

d 99

Density [g/cm³]
calculated, at room temperature (approx. 23 °C)
1.8

Curable layer thickness [mm]
DELO Standard 20
4

UVA intensity: 55 - 60 mW/cm² DELOLUXcontrol, DELOLUX 03

Viscosity [mPas]
at 23 °C, Brookfield spindle/rpm 7/5
112000

Thixotropy index
2

Processing time
30ml cartridges at room temperature (max. 25°C)
1 week

Processing time
900ml cartridge at room temperature (max. 25 °C)
3 days
Minimal irradiation time [s]
DELO Standard 37, DSC
DELOLUX; 365 nm LED; intensity: 200 mW/cm²; DELOLUXcontrol;

Recommended irradiation time [s]
LED intensity: 200 mW/cm², DELOLUXcontrol

Recommended irradiation time [s]
UVA-intensity: 55 - 60 mW/cm² DELOLUXcontrol

Curing time until final strength [h]
at room temperature (approx. 23 °C) after irradiation

**Compression shear strength glass/glass [MPa]**
DELO Standard 5
UVA intensity: 55 - 60 mW/cm² DELOLUXcontrol, irradiation time: 30 s
curing time: 24 h at room temperature (approx. 23 °C)

**Compression shear strength glass/FR4 [MPa]**
DELO Standard 5
UVA intensity: 55 - 60 mW/cm², DELOLUXcontrol, irradiation time: 30 s
curing time: 24 h at room temperature (approx. 23 °C)

**Compression shear strength glass/Al [MPa]**
DELO Standard 5
UVA intensity: 55 - 60 mW/cm², DELOLUXcontrol, irradiation time: 30 s
curing time: 24 h at room temperature (approx. 23 °C)

**Compression shear strength glass/PBT [MPa]**
DELO Standard 5
UVA intensity: 55 - 60 mW/cm² DELOLUXcontrol, irradiation time: 30 s
curing time: 24 h at room temperature (approx. 23 °C)

**Compression shear strength glass/PC [MPa]**
DELO Standard 5
UVA intensity: 55 - 60 mW/cm² DELOLUXcontrol, irradiation time: 30 s
curing time: 24 h at room temperature (approx. 23 °C)

**Tensile strength [MPa]**
DIN EN ISO 527
41

**Elongation at tear [%]**
DIN EN ISO 527
0.6

**Young's modulus [MPa]**
DIN EN ISO 527
6900

**Shore hardness D**
according to DIN EN ISO 868
91

**Decomposition temperature [°C]**
DELO Standard 36
291

**Glass transition temperature [°C]**
TMA
120

**Coefficient of linear expansion [ppm/K]**
TMA, in a temperature range of +30 to +120 °C
32

**Shrinkage [vol. %]**
DELO Standard 13
2

**Water absorption [weight %]**
according to DIN EN ISO 62, 24 h at room temperature (approx. 23 °C)
0.1

**Ion content Cl- [ppm]**
<10

**Ion content F- [ppm]**
<100
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ion content Na+ [ppm] extraction</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Ion content K+ [ppm] extraction</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Specific volume resistance [Ωcm]</td>
<td>&gt;1xE13</td>
</tr>
<tr>
<td>Surface resistance [Ω]</td>
<td>&gt;1xE13</td>
</tr>
<tr>
<td>Dielectric constant</td>
<td>3.5</td>
</tr>
<tr>
<td>RF-IV method, 1 MHz, at 25 °C +/- 3 °C</td>
<td></td>
</tr>
<tr>
<td>Dielectric constant</td>
<td>3.5</td>
</tr>
<tr>
<td>RF-IV method, 10 MHz, at 25 °C +/- 3 °C</td>
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</tr>
<tr>
<td>Dielectric constant</td>
<td>3.5</td>
</tr>
<tr>
<td>RF-IV method, 100 MHz, at 25 °C +/- 3 °C</td>
<td></td>
</tr>
<tr>
<td>Dielectric constant</td>
<td>3.2</td>
</tr>
<tr>
<td>RF-IV method, 1 GHz, at 25 °C +/- 3 °C</td>
<td></td>
</tr>
<tr>
<td>Creep resistance CTI</td>
<td>600 M</td>
</tr>
<tr>
<td>VDE 0303, part 1, IEC 112</td>
<td></td>
</tr>
<tr>
<td>Storage life at 0 °C to +10 °C</td>
<td>6 months</td>
</tr>
<tr>
<td>in unopened original container</td>
<td></td>
</tr>
</tbody>
</table>
Performance under temperature influence

Compression/shear strength glass/glass after temperature storage
based on initial value at room temperature
measured at room temperature (approx. 23 °C)
according to DELO standard 5

Young’s modulus after temperature storage
based on initial value at room temperature
measured at room temperature (approx. 23 °C)
according to DIN EN ISO 527, test specimen type 1B,
thickness 2 mm

Tensile strength after temperature storage
based on initial value at room temperature
measured at room temperature (approx. 23 °C)
according to DIN EN ISO 527, test specimen type 1B,
thickness 2 mm

Elongation at tear after temperature storage
based on absolute initial value at room temperature
measured at room temperature (approx. 23 °C)
according to DIN EN ISO 527, test specimen type 1B,
thickness 2 mm
Performance under chemical influence

Compression shear strength after storage for 1,000 h
based on initial value at room temperature
measured at room temperature (approx. 23 °C)
according to DELO Standard 5

<table>
<thead>
<tr>
<th>Chemical medium</th>
<th>Compression/shear strength glass/Al [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>72</td>
</tr>
<tr>
<td>ethanol denatured</td>
<td>91</td>
</tr>
<tr>
<td>ethanol 70 % denatured</td>
<td>59</td>
</tr>
<tr>
<td>ATF gear oil</td>
<td>110</td>
</tr>
<tr>
<td>petrol</td>
<td>98</td>
</tr>
<tr>
<td>diesel fuel</td>
<td>74</td>
</tr>
<tr>
<td>engine oil 10W40</td>
<td>91</td>
</tr>
<tr>
<td>acetic acid 10 %</td>
<td>55</td>
</tr>
<tr>
<td>demineralised water / glykol mixture 50:50</td>
<td>87</td>
</tr>
</tbody>
</table>

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 KATIOBOND 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.