

# DELO<sup>®</sup>-ML DB133

**modified acrylate | 1C | UV- / anaerobic-curing**

free of solvents | can be fixed quickly | dual-curing, tension-equalizing

### Special features of product

- compliant with RoHS Directive 2015/863/EU
- compliant with limits of VOC content in adhesive acc. to GB33372-2020

### Function

- construction adhesive
- structural adhesive

### Typical area of use

- -40 - 150 °C
- glass/metal bondings
- small metal areas with high fitting accuracy
- screw locking and thread sealing

### Curing

Suitable lamp types UVA, LED 365 nm

Typical irradiation time

*intensity 60 mW/cm<sup>2</sup>  
UVA* 25 s

Curing time

*until initial strength  
at rt approx. +23 °C  
anaerobic on zinc-phosphated screws* 3 - 6 min

*until final strength  
at rt approx. +23 °C  
anaerobic on zinc-phosphated screws* 24 h

### Processing

Conditioning time (typical)

*when stored in cold conditions  
in containers up to 50 ml* 30 min

*when stored in cold conditions  
in containers up to 600 ml* 4 h

Storage life in unopened original container

|   |   |          |
|---|---|----------|
| <i>up to &lt;= 600 ml<br/>at 0 °C to +10 °C</i> | 6 | month(s) |
| <i>up to &lt;= 200 ml<br/>at 0 °C to +25 °C</i> | 9 | month(s) |

**Technical properties**

|  |             |
|--|-------------|
| Color in uncured condition                         | colorless   |
| Transparency                                       | transparent |
| Color in cured condition in 0.1 mm layer thickness | colorless   |
| Color in cured condition in 1 mm layer thickness   | colorless   |

**Parameters**

|   |     |                   |
|---|-----|-------------------|
| Density<br><i>liquid</i>  | 1.1 | g/cm <sup>3</sup> |
| Viscosity<br><i>liquid   Rheometer   Shear rate: 10 1/s   Gap: 200 µm</i>   | 730 | mPa·s             |
| Maximum curable layer thickness<br><i>DELO Standard 20   <b>White substrate</b>   365 nm   200 mW/cm<sup>2</sup>   Irradiation time (unit): s</i>     | 1   | mm                |
| Off-torque<br><i>by the criteria of ISO 10964   <b>Steel, zinc-phosphated</b>   <b>Steel, zinc-phosphated</b>   at approx. +23 °C   24 h</i>          | 30  | Nm                |
| Tensile shear strength<br><i>by the criteria of DIN EN 1465   <b>Al</b>   <b>Al</b>   at approx. +23 °C   72 h</i>                                    | 5   | MPa               |
| Tensile shear strength<br><i>by the criteria of DIN EN 1465   <b>Al</b>   <b>Al</b>   Pretreatment: sand-blasted   at approx. +23 °C   72 h</i>       | 12  | MPa               |
| Tensile shear strength<br><i>by the criteria of DIN EN 1465   <b>Steel</b>   <b>Steel</b>   at approx. +23 °C   72 h</i>                              | 11  | MPa               |
| Tensile shear strength<br><i>by the criteria of DIN EN 1465   <b>Steel</b>   <b>Steel</b>   Pretreatment: sand-blasted   at approx. +23 °C   72 h</i> | 14  | MPa               |
| Compression shear strength<br><i>DELO Standard 5   <b>Glass</b>   <b>Glass</b>   365 nm   200 mW/cm<sup>2</sup>   60 s</i>                            | 30  | MPa               |

Compression shear strength 10 MPa  
*DELO Standard 5 | PA6 | Stainless steel | Pretreatment: Annealing | 365 nm | 200 mW/cm<sup>2</sup> | 60 s*

Compression shear strength 6 MPa  
*DELO Standard 5 | PA6 | Stainless steel | Pretreatment: Activator | Activator for component 1: DELO-QUICK 5002 | 72 h*

Compression shear strength 18 MPa  
*DELO Standard 5 | PA6 | PA6 | Pretreatment: Annealing | 365 nm | 200 mW/cm<sup>2</sup> | 60 s*

Compression shear strength 10 MPa  
*DELO Standard 5 | PMMA | PMMA | 365 nm | 200 mW/cm<sup>2</sup> | 60 s*

Compression shear strength 16 MPa  
*DELO Standard 5 | PPA | Stainless steel | Pretreatment: Activator | Activator for component 1: DELO-QUICK 5006 | 24 h*

Compression shear strength 3 MPa  
*DELO Standard 5 | PPS | Stainless steel | Pretreatment: Activator | Activator for component 1: DELO-QUICK 5006 | 24 h*

Compression shear strength 13 MPa  
*DELO Standard 5 | PS | PS | 60 mW/cm<sup>2</sup> | 110 s*

Compression shear strength 15 MPa  
*by the criteria of ISO 10123 | Steel shaft | Steel hub | at approx. +23 °C | 1 h*

Compression shear strength 28 MPa  
*by the criteria of ISO 10123 | Steel shaft | Steel hub | at approx. +23 °C | 72 h*

Tensile strength 20 MPa  
*by the criteria of DIN EN ISO 527 | 60 mW/cm<sup>2</sup> | 90 s*

Elongation at tear 130 %  
*by the criteria of DIN EN ISO 527 | 60 mW/cm<sup>2</sup> | 90 s*

Young's modulus 300 MPa  
*by the criteria of DIN EN ISO 527 | 60 mW/cm<sup>2</sup> | 90 s*

Shore hardness D 44  
*by the criteria of DIN EN ISO 868 | 60 mW/cm<sup>2</sup> | 90 s*

Glass transition temperature 104 °C  
*Rheometer | 60 mW/cm<sup>2</sup>*

Coefficient of linear expansion 184 ppm/K  
*DELO Standard 26 | TMA | Evaluation T: 100 °C - 150 °C*

Shrinkage 8.6 vol. %  
*DELO Standard 13 | 60 mW/cm<sup>2</sup> | 90 s*

Volume resistivity  
by the criteria of DIN EN 62631-3-1

>1xE16 Ohm·cm

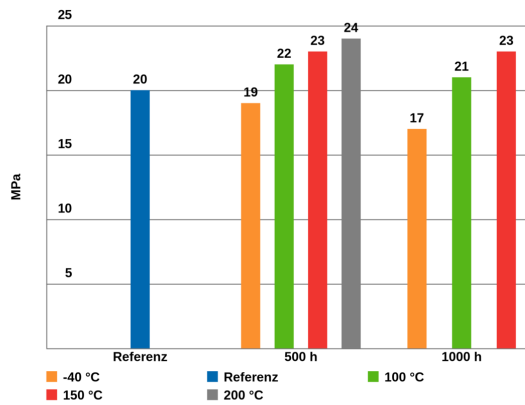
Surface resistance  
by the criteria of DIN EN 62631-3-2

>1xE14 Ohm

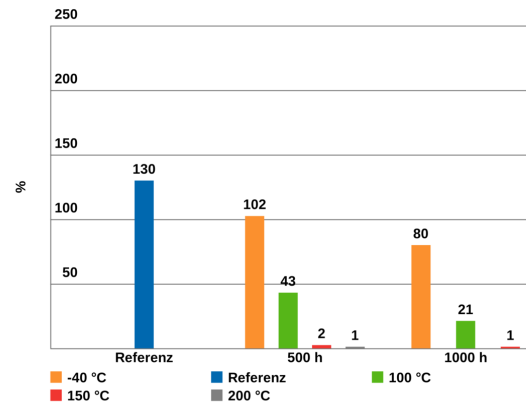
Creep resistance CTI M  
by the criteria of VDE 0303-11

>600 M

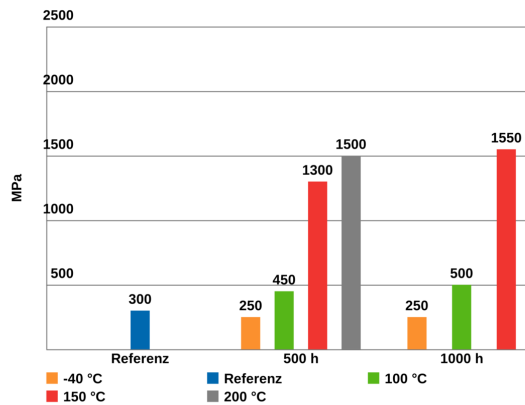
Tensile strength after thermal storage, based on DIN EN ISO 527



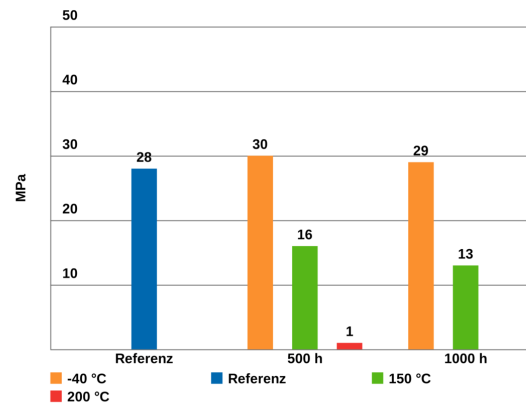
Elongation at tear after thermal storage, based on DIN EN ISO 527



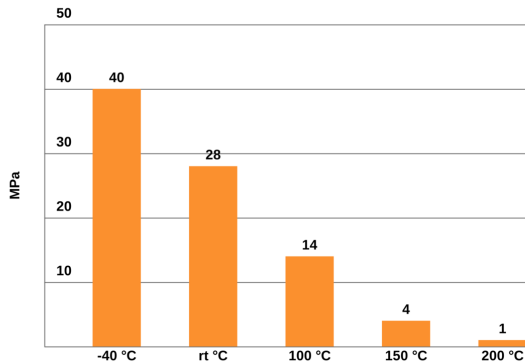
Young's modulus after thermal storage  
Curing 60 mW/cm² 90 s /



Compression shear strength after thermal storage, based on ISO 10123



Compression shear strength measured at the stated temperatures



Substrates: steel shaft / steel hub

**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 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. All curing or light fixation parameters depend on material thickness and absorption, adhesive layer thickness, lamp type and distance between lamp and adhesive layer. 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.

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**

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.

**CONTACT**