

### **DELO®-ML DB180**

Anaerobic- and light curing adhesive, high-viscous

#### **Base**

- Modified urethane acrylate
- one-component, solvent-free
- dual-curing adhesive

#### **Use**

- for tension-equalizing metal bondings
- fixing: coaxial components, e. g., bearings or sockets
- adhesive leaking from the bonding gap can be cured in seconds with visible light
- therefore, firmness to touch can be reached faster
- if one of the components to be bonded is translucent, specific plastics can also be bonded through polymerization
- DELO curing lamps generating radiation adjusted to the adhesives are available to initiate this reaction
- also suitable for the bonding of components with dissimilar coefficients of expansion due to flexibilized and tension-equalizing nature
- easy application control due to fluorescent color
- the cured product is normally used in a temperature range of -60 °C to +180 °C; depending on the application, other limits may be more reasonable
- compliant with RoHS directive 2015/863/EU

#### **Processing**

- the surfaces to be bonded must be dry as well as free of dust, grease and other contaminations
- DELOTHEN cleaners are recommended for the optimal preparation of bonding areas
- thread connections must be tightened well
- the adhesive is good to dispense from original containers or by means of dispensing systems suitable for anaerobic-curing adhesives

## **Curing**

- anaerobic, i.e., by exclusion of air and under metal influence at room temperature with small gap
- the curing may be assisted by application of heat, use of activator and/or light, e.g. if the curing speed is too slow or if it comes to larger gaps
- the build-up of strength depends on the components and the geometry joined. The initial strength is achieved after just a few minutes. Significant acceleration is possible by using an activator and/or applying heat
- curing with UV light in a wavelength range of 320 – 450 nm. DELOLUX LED curing lamps are especially suitable as per the chart below. All standard DELOLUX HID discharge lamps are also suitable
- when using light fixation, an intensity at the adhesive of 700 mW/cm<sup>2</sup> should not be exceeded. Application related, higher intensities can be useful
- both curing mechanisms can be used in combination or separately

Lamp type	DELOLUX 20 / 50 / 80		
Wavelength [nm]	365	400	460
Suitability	++	++	-

- not suitable + suitable ++ especially suitable

## **Properties**

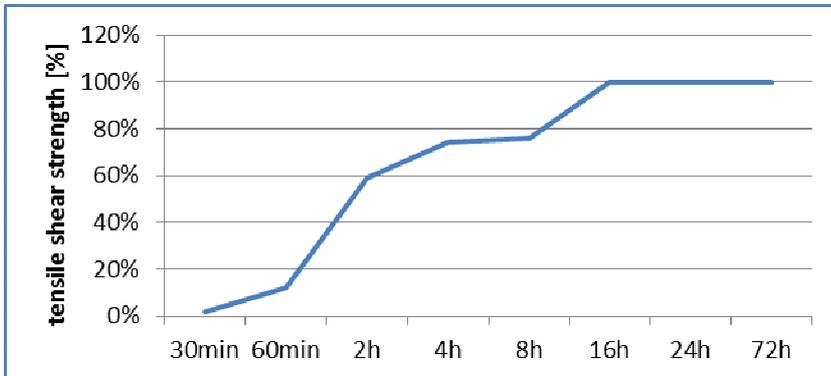
- high-viscous
- flexible setting
- light-curing and anaerobic-curing
- visible adhesive in boundary areas can be cured with visible light
- high strength, difficult to remove
- very good strengths and low roughness depth of the bonding areas

## **Technical data**

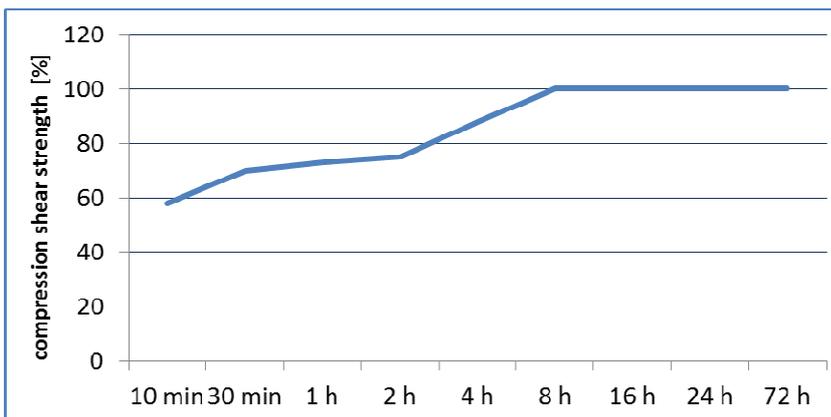
<i>Color</i>	clear- yellowish and fluorescent
preferred clearance [mm]	0,05-0,1
clearance with heat or activator [mm]	up to 0,3-0,4
clearance with light curing [mm]	4
Density [g/cm <sup>3</sup> ] at room temperature (approx. 23 °C)	1.1
Viscosity [mPas] at 23 °C, Brookfield spindle/rpm 4/5	17000
<i>Curing time until initial strength</i> [min] at room temperature (approx. 23 °C), anaerobic on zinc-phosphated screws	approx. 3- 6
Minimal irradiation time [s] DELO Standard 23, UVA intensity: 60 mW/cm <sup>2</sup> , DELOLUXcontrol	10
Off-torque with M(on) 46 Nm [Nm]	60
<i>Compression shear strength shaft/hub steel</i> [MPa] according to ISO 10123	40

## curing progress

compression shear strength shaft-hub joint  
 based on initial value at room temperature  
 measured at room temperature (approx. 23 °C)  
 according to ISO 10123



compression shear strength shaft-hub joint with activator DELO-QUICK 5006  
 based on initial value at room temperature  
 measured at room temperature (approx. 23 °C)  
 according to ISO 10123

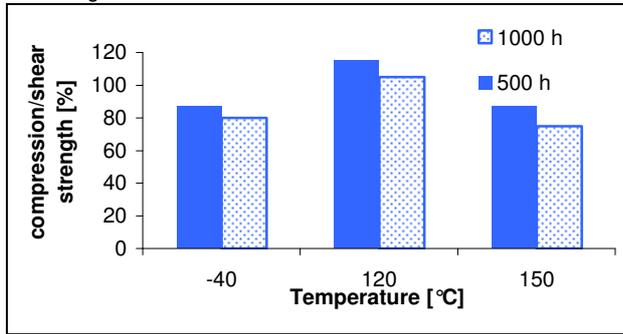


Compression shear strength glass/glass [MPa] DELO Standard 5 UVA intensity: 55 - 60 mW/cm <sup>2</sup> , DELOLUXcontrol	25
Compression shear strength PA/PA [MPa] DELO Standard 5 UVA intensity: 55 - 60 mW/cm <sup>2</sup> , DELOLUXcontrol	20
Compression shear strength stainless steel/PA [MPa] DELO Standard 5 UVA intensity: 55 - 60 mW/cm <sup>2</sup> , DELOLUXcontrol	10
Tensile shear strength Al/Al [MPa] DIN EN 1465, blank	6
Tensile shear strength Al/Al [MPa] DIN EN 1465, sand- blasted	13
Tensile shear strength St/St [MPa] DIN EN 1465, blank	12
Tensile shear strength St/St [MPa] DIN EN 1465, sand-blasted	14

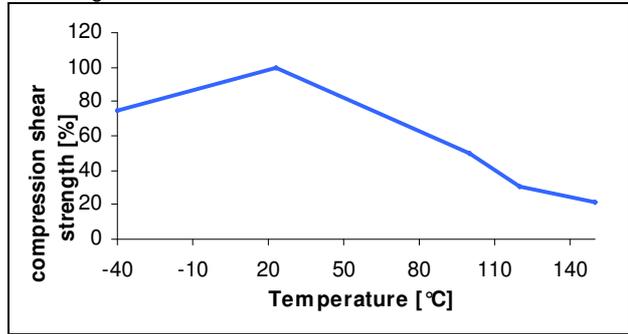
<b>Tensile strength [MPa]</b> according to DIN EN ISO 527	25
<b>Elongation at tear [%]</b> according to DIN EN ISO 527	40
<b>Young's modulus [MPa]</b> according to DIN EN ISO 527	900
<b>Shore hardness D</b> according to DIN EN ISO 868	76
<b>Glass transition temperature [°C]</b> DELO Standard 24, Rheometer	90
<b>Coefficient of linear expansion [ppm/K]</b> TMA, DELO Standard 26 in a temperature range of +30 to +150 °C	195
<b>Shrinkage</b> DELO Standard 13	7.8
<b>Water absorption [%]</b> DIN EN ISO 62	1.1

## Performance under temperature influence

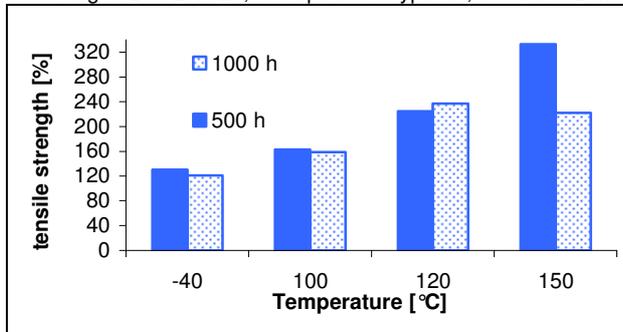
compression/shear strength shaft -hub joint  
after temperature storage  
based on initial value at room temperature  
measured at room temperature (approx. 23 °C)  
according to ISO 10123



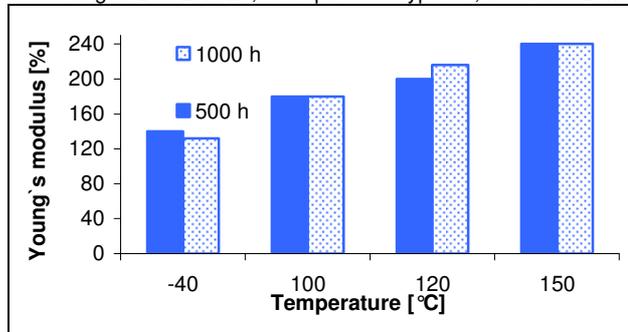
compression/shear strength shaft-hub joint at temperature  
based on initial value at room temperature  
measured at determined temperature  
according to ISO 10123



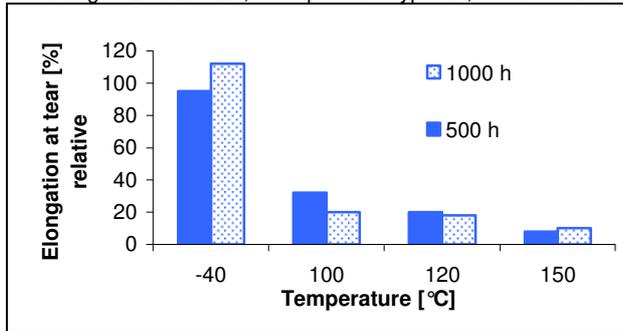
tensile strength after temperature storage  
based on initial value at room temperature  
measured at room temperature (approx. 23 °C)  
according to DIN EN 527, test specimen type 5A, thickness 2 mm



Young's modulus after temperature storage  
based on initial value at room temperature  
measured at room temperature (approx. 23 °C)  
according to DIN EN 527, test specimen type 5A, thickness 2 mm



elongation at tear after temperature storage  
based on initial value at room temperature  
measured at room temperature (approx. 23 °C)  
according to DIN EN 527, test specimen type 5A, 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 ISO 10123

Chemical medium	Compression/shear strength shaft-hub joint [%]
ATF gear oil	105
Diesel fuel	97
engine oil	101
fuel	97

Storage life at room temperature (max. 25 °C)  
in unopened original container up to 600 ml

6 months

Storage life cartridge at room temperature (max. 25 °C)  
in unopened original container

3 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-ML are available on: [www.DELO.de](http://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.