



**UV-lijm, acrylaat**  
DELO-PHOTOBOND

**Kenmerken**

- ✓ Eén component
- ✓ Uitharding door zichtbaar en/of UV licht
- ✓ Verlijmen van verschillende materialen oa glas, ceramiek, metaal, plastic en hout
- ✓ Geschikt voor het verlijmen met hoge eisen
- ✓ Grote elasticiteit

**Toepassingsgebieden**

- ✓ (toeleveranciers) Automobiel industrie
- ✓ Consumenten elektronica
- ✓ Glas lijmen
- ✓ Optisch verlijmen (optical bonding)
- ✓ Photovoltaïcs
- ✓ Communicatie elektronica
- ✓ Kunststof/ plastic



**UV-lijm, epoxy**  
DELO-KATIOBOND

**Kenmerken**

- ✓ Activatie binnen enkele secondes voor korte doorlooptijden in de productie
- ✓ Geschikt voor ondoorzichtbare materialen
- ✓ Breed temperatuurbereik

**Toepassingsgebieden**

- ✓ (toeleveranciers) Automobiel industrie
- ✓ Optisch verlijmen (optical bonding)
- ✓ Semiconductor packaging
- ✓ Smart card / RFID
- ✓ Elektronica
- ✓ Organic Electronics



**Combinatie van licht met  
luchtvochtigheid of warmte**  
DELO-DUALBOND

**Kenmerken**

- ✓ Snelle en betrouwbare uitharding in schaduwzones
- ✓ Hechting op vele materialen
- ✓ Geschikt voor ingieten en afdichten
- ✓ Flexibel maar ook harde varianten leverbaar
- ✓ Optisch transparant
- ✓ Goede hechting bij thermische spanningen

**Toepassingsgebieden**

- ✓ (toeleveranciers) Automobiel industrie
- ✓ Consumenten elektronica
- ✓ Display
- ✓ Optoelectronics



**Eén component epoxy**  
DELOMONOPOX

**Kenmerken**

- ✓ Eén component
- ✓ Warmuithardend
- ✓ Hoge weerstand tegen chemicaliën en warmte

**Toepassingsgebieden**

- ✓ (toeleveranciers) Automobiël industrie
- ✓ Consumenten elektronica
- ✓ Machinebouw
- ✓ Optoelectronics
- ✓ Photovoltaïcs
- ✓ Smart card / RFID
- ✓ Halfgeleider industrie



**Twee componenten epoxy**  
DELO-DUOPOX  
SIKO-EPOXY

**Kenmerken**

- ✓ Twee componenten
- ✓ Uitharding op kamertemperatuur, welke versneld kan worden middels warmte
- ✓ Normaal temperatuur bereik tot 140°C
- ✓ Hoge weerstand tegen chemicaliën en warmte

**Toepassingsgebieden**

- ✓ (toeleveranciers) Automobiël industrie
- ✓ Consumenten elektronica
- ✓ Machinebouw
- ✓ Optoelectronics
- ✓ Photovoltaïcs



**PU lijmen**  
DELO-PUR  
SIKO-PU

**Kenmerken**

- ✓ Goede elastische eigenschappen
- ✓ Uitstekende sterkte
- ✓ Geschikt voor grote verbindingen

**Toepassingsgebieden**

- ✓ (toeleveranciers) Automobiël industrie
- ✓ Machinebouw
- ✓ Photovoltaïcs



**Siliconen**  
DELO-GUM

**Kenmerken**

- ✓ Geschikt voor elastische verbindingen
- ✓ Goede chemische bestendigheid
- ✓ Zeer goede weers- en verouderingsbestendigheid
- ✓ Hoge flexibiliteit

**Toepassingsgebieden**

- ✓ Machinebouw



**Borgmiddel**  
DELO-ML  
SIKO-ML

**Kenmerken**

- ✓ Eén component
- ✓ Producten met extra UV / lichtuitharding mechanisme beschikbaar
- ✓ Verschillende sterkte classificaties van verwijderbaar tot hoge sterkte
- ✓ Flexibel en slagvast
- ✓ Uitstekende weerstand tegen hoge temperaturen
- ✓ Normaal temperatuurbereik gebruik van -60°C tot 200°C

**Toepassingsgebieden**

- ✓ (toeleveranciers) Automobiël industrie
- ✓ Consumenten elektronica
- ✓ Machinebouw



**Secondenlijm**  
DELO-CA  
SIKO-CA

**Kenmerken**

- ✓ Uitharding in slechts enkele seconden
- ✓ Hoge sterkte op verschillende materialen
- ✓ Eenvoudig te doseren

**Toepassingsgebieden**

- ✓ (toeleveranciers) Automobiël industrie
- ✓ Consumenten elektronica



### Methyl methacrylate (MMA)

- DELO-Maflex
- SIKO-S1600
- SIKO-S3000

### Kenmerken

- ✓ Twee componenten
- ✓ Uitstekende sterkte
- ✓ Flexibel en slagvast

### Toepassingsgebieden

- ✓ (toeleveranciers) Automobiel industrie
- ✓ Machinebouw
- ✓ Metalen

### 1K lijmen en kitten

- MS Polymeer
- PU



### Kenmerken

- ✓ Eén component
- ✓ Uitharding bij kamertemperatuur
- ✓ Universele lijm en afdichtingmiddel
- ✓ Verkrijgbaar in verschillende kleuren

### Toepassingsgebieden

- ✓ (toeleveranciers) Automobiel industrie
- ✓ Bouw & Constructie
- ✓ Interieur
- ✓ Jachtbouw
- ✓ Sanitair

### Cleaners

- DELOTHEN EP
- DELOTHEN NK1
- DELOTHEN NK3
- IPA



### Kenmerken

- ✓ Reinigen van ondergrond
- ✓ Oppervlaktevoorbehandeling
- ✓ Schoonmaken van niet uitgeharde kleefstofresten.

### Toepassingsgebieden

- ✓ (toeleveranciers) Automobiel industrie
- ✓ Consumenten elektronica
- ✓ Machinebouw
- ✓ Metalen
- ✓ Kunststof/ plastic



Siko BV

# Official distributor for: **DELO** INDUSTRIAL ADHESIVES

DELO is a world-leading manufacturer of industrial adhesives and specialist in the field of high-tech adhesive processes for technical applications

## DELO-PHOTOBOND – UV curing & light cured acrylic adhesive

### Technical Data



Photoinitiated-curing acrylates are one-component reaction resins. They cure at room temperature by exposure to UV light and/or visible light. Light-curing acrylates are used in joints where at least one component is made of a translucent material. The DELO-PHOTOBOND adhesives are characterized by a graduated elastification from hard to tension-equalizing. Fast curing within seconds makes possible extremely short cycle times in production

### Properties

- ✓ One-component
- ✓ Curing by exposure to visible light and/or UV light
- ✓ Bonding of many materials such as glass, ceramic, metal, plastic and wood
- ✓ Suitable for bondings where appearance is a high requirement
- ✓ Wide range of elasticity

### Application areas

- ✓ Automotive
- ✓ Consumer electronics
- ✓ Glass
- ✓ Displays
- ✓ Photovoltaics

Further application areas

- ✓ Communication electronics | Plastic

### Selection Chart

### Data sheets

Product	Viscosity (mPas)	Compression shear strength (MPa)			Tensile strength (MPa)	Characteristics
		glass /glass	glass /Al	glass /PC		
GB310	100	34	40	4	33	Glass adhesive, capillary, high-strength
GB345	1.500	29	27	7	26	Glass-to-metal connections
GB368	5.700	23	23	7	20	Glass adhesive, also for glass-to-plastic connection, dry surface
PB437	8.000 thix	31	30	14	21	Multi-purpose adhesive, very fast curing, tough-hard
4494	20.000 thix	28	25	15	20	Multi-purpose adhesive, tough-hard, fast curing
AD491	90.000	25	25	18	20	Multi-purpose adhesive, excellent humidity resistance
4436	350	18	17	7	12	Multi-purpose adhesive, fast curing
4442	650	4	4	5	3	Flexible, sealing, USP XXIII Class VI approval
4468	7.000 thix	22	24	3	14	Glass and glass-to-metal connections, USP XXIII Class VI approval
4496	17.000 thix	6	4	5	6	Flexible, sealing, run-resistant
4497	30.000 thix	19	19	10	11	Multi-purpose adhesive, dry surface
AD414	1.300	7	8	-	8	Multi-purpose adhesive, good flow properties, very good sealing properties
AD494	50.000 thix	13	12	13	13	Multi-purpose adhesive, steady, gap-filling
SD4196	47.000 thix	6	6	3	3	Peel-resistant plastic bondings, dry surface, tension-equalizing

### Other adhesive products in the DELO-PHOTOBOND serie are:

400, 4302, AD4085, AD413, AD438, AD470, AD474, AD478, AD484, AD485, FB4175, GB422, GE4009, LP415, LP424, MF4055, OC4011, OC4022, SD496, UB4086

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## DELO-KATIOBOND – UV curing & light activated epoxy adhesives

### Technical Data



DELO supplies a great variety of light-curing and UV-curing epoxy resins. The product range includes adhesives for complex automotive and optoelectronic applications, chip encapsulates for fast in-line processes (Dam&Fill), encapsulates with a high water barrier effect for organic electronics, and many more. Thanks to their high transparency and their thermal stability, the materials can also be used in the production of optical components. Further important properties include low shrinkage during polymerization, low out gassing, good chemical resistance, and high ion purity. The special feature of DELO's products is that they can be preactivated. Therefore, it is also possible to use DELO-KATIOBOND to bond opaque materials.

#### Properties

- ✓ Activation within seconds for short cycle times in production
- ✓ Suitable for opaque materials
- ✓ Wide temperature range of use

#### Application areas

- ✓ Automotive
  - ✓ Displays
  - ✓ Optoelectronics
  - ✓ Semiconductor packaging
  - ✓ Smart card / RFID
- Further application areas
- ✓ Electronics | Organic electronics

### Selection Chart

### Data sheets

Product	Viscosity (mPas)	Compression shear strength (MPa)			Tensile strength (MPa)	Characteristics
		glass /glass	glass /Al	glass /FR4		
4552	1.200	24	17	27	24	Good flow behavior, hard composite, fast curing
KB554	1.500	31	22	21	16	Good flow behavior, tough-elastic, tension-equalizing, fast curing
4557	3.500	10	9	14	6	Good flow behavior, tough-hard
4578	12.400 thix	27	20	20	21	Medium-viscous, hard composite, fast curing
4591	23.000 thix	20	15	19	8	Medium-viscous, tough-elastic, tension-equalizing
4594	32.000 thix	25	20	18	31	Fills gaps, hard composite, fast curing
45952	32.000 thix	30	13	19	18	Fills gaps, tough-elastic, tension-equalizing
4597	48.000 thix	10	10	11	4	Fills gaps, tough-hard
AD640	9.000 thix	22	16	20	45	Medium-viscous, very fast build-up of adhesion, very good chemical resistance, low water absorption, low ion content, very low out gassing
OB642	9.500	23	16	12	46	Fast build-up of adhesion, high TG, high optical transparency and yellowing resistance
4670	4.800	35	10	35	30	Good flow behavior, low water absorption, very low ion content, chip encapsulation compound
DF698	180.000 thix	28	12	23	32	Very steady, low water absorption, very low ion content, Dam for chip encapsulation compounds
OB678	60.000	15	11	12	37	Fast build-up of adhesion, good adhesion and humidity resistance on stainless steel

Other adhesive products in the DELO-KATIOBOND serie are:

4653, GE680, LP655, LP686, OB665

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## DELO-DUALBOND – Combination of light curing and either heat or humidity

### Technical Data



In some applications, it is not possible to cure the adhesives by mere exposure to light. Therefore, dual curing mechanisms are highly beneficial, especially when bonding components with large shadowed areas. It combines the opportunities of light curing with reliable curing in shadowed areas by an additional curing mechanism, for example by heat or humidity.

Properties	Application areas
<ul style="list-style-type: none"> <li>✓ Good resistance to thermal shock stress</li> <li>✓ Fast and reliable light curing in shadowed areas</li> <li>✓ Universal adhesion to many substrates</li> <li>✓ Optimized flow behavior for sealing and casting</li> <li>✓ Versions range from flexible to hard</li> <li>✓ Optically transparent adhesives available for large-area bonding</li> </ul>	<ul style="list-style-type: none"> <li>✓ Automotive</li> <li>✓ Consumer electronics</li> <li>✓ Displays</li> <li>✓ Optoelectronics</li> </ul> <p>Further application areas</p> <ul style="list-style-type: none"> <li>✓ Electronics   Mobile phone</li> </ul>

<a href="#">Selection Chart - acrylic adhesive</a> <a href="#">Selection Chart - epoxy adhesives</a>					<a href="#">Data sheets</a>	
Product	Viscosity (mPas)	Compression shear strength (MPa)			Tensile strength (MPa)	Characteristics
		glass /glass	glass /Al	PMMA /PMMA		
AD4950	36.000	9	6	8	8	Multi-purpose adhesive, reliable curing in shadowed areas by air humidity, very fast light fixation, very low postcuring effect
GE4910	2.000	7	6	-	6	Multi-purpose adhesive, highly flexible, good flow properties, reliable curing in shadowed areas by air humidity, very fast light fixation, very low postcuring effect
AD4930	14.000	9	4	7	5	Multi-purpose adhesive, flexible, reliable curing in shadowed areas by air humidity, very fast light fixation, very low postcuring effect
AD465	24.000	23	22	-	17	Multi-purpose adhesive, dry surface, build-up of strength in shadowed area by heat, very fast light fixation, very low postcuring effect
AD761	11.000 thix	25	18	8	23	In shadow areas the product can be cured by heat, light and heat curing mechanism can be used independently
OB749	13.000	25	16	9	41	Fast build-up of adhesion, low-temperature-curing, in shadowed areas the product can be heat-cured, fast fixing time of 1 – 5 sec
<b>Other adhesive products in the DELO-DUALBOND serie are:</b> AD340, AD342, AD345, AD347, GE4707, GE4906, GE4949, GE731, IC343, LT2216, LT3411, LT354, MF4990, OB787, OC4911, OC4922, OC4925, RE3440, SL4955						

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## DELOMONOPOX – One part heat cured epoxy resin

### Technical Data



DELO supplies a wide range of DELOMONOPOX adhesives. These are based on disparate chemistries and meet all of our customers' needs. Our portfolio of DELOMONOPOX adhesives ranges from anhydrides and aminic adhesives, to mCD adhesives and heat-curing cationic products, to heat-curing acrylates.

#### Properties

- ✓ One-component
- ✓ Heat-curing
- ✓ High resistance to chemicals and heat

#### Application areas

- ✓ Application areas
- ✓ Consumer electronics
- ✓ Automotive
- ✓ Mechanical engineering
- ✓ Optoelectronics
- ✓ Photovoltaics
- ✓ Smart card / RFID
- ✓ Semiconductor packaging

Further application areas

- ✓ Assembly | Fixing of SMD components | Smart card | Smart label

### Selection Chart

### Data sheets

Product	Viscosity (mPas)	Curing conditions	Tensile shear strength (MPa)		Characteristics
			1.6mm	6mm	
AD295	230.000	150°C / 40min	30	-	High strength
AD066	20.000	130°C / 20 min	18	35	Fast curing
1197		150°C / 40 min	26	55	High run resistance, high strength
AD286	110.000	140°C / 40 min	33	-	
HT281	125.000	150°C / 40 min	24	n.a.	
HT282	125.000	150°C / 40 min	29	n.a.	
LT204	20.000	90°C 60 min	20	n.a.	
6093	31.000	130°C / 30 min	14	-	Good flow behavior
6095	50.000	130°C / 30 min	18	-	Low chloride ion content < 0.02%, for the use in electronics
DA255	25.000	150°C / 2 min	-	n.a.	
NU257	29.000	140°C / 20 min	-	n.a.	
AC268	32.000	190°C / 6 sec	-	n.a.	
AC245	33.000	200°C / 6sec	-	n.a.	

#### Other adhesive products in the DELOMONOPOX serie are:

AC265, AC365, AD224, AD288, AD293, AD297, AD298, AD480, DA358, DA375, DA378, DA587, DA772, GE725, GE727, GE730, GE765, GE785, HT283, HT760, MG063, MK055, MK096, NU355, SJ2720

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## DELO-DUOPOX – Two part cold cured epoxy resin

### Technical Data



DELO supplies a wide range of two-component reaction adhesives on the basis of epoxy resins. These range from fast-curing materials to highly resistant structural adhesives to flexible and tension-equalizing compounds that also withstand thermal stress. DELO's product range also includes special casting resins and removable adhesives used in photovoltaics for wafer sawing and in the semiconductor industry. DELO-DUOPOX adhesives cure at room temperature after mixing resin and hardener. Most adhesives are available in the practical DELO-AUTOMIX system. With double chamber cartridges and static mixing tubes, the DELO-DUOPOX products can be processed like one-component adhesives. In general, DELO-DUOPOX adhesives are characterized by adhesion to nearly any material, high resistance to chemicals, and excellent mechanical properties. Therefore, they are used in a great variety of industrial fields.

Properties	Application areas
<ul style="list-style-type: none"> <li>✓ Curing at room temperature which can be accelerated by heat</li> <li>✓ Two-component</li> <li>✓ Some adhesives can be processed like one-component adhesives by means of the DELO-AUTOMIX system</li> <li>✓ Multi-purpose</li> <li>✓ Robust</li> <li>✓ Normal temperature range of use up to 140 °C</li> <li>✓ High resistance to a wide variety of chemicals and heat</li> </ul>	<ul style="list-style-type: none"> <li>✓ Automotive</li> <li>✓ Consumer electronics</li> <li>✓ Mechanical engineering</li> <li>✓ Optoelectronics</li> <li>✓ Photovoltaics</li> </ul> <p>Further application areas</p> <ul style="list-style-type: none"> <li>✓ Metal processing   Aerospace industry   Ship building</li> </ul>

### Selection Chart

### Data sheets

Product	Viscosity (mPas)	Curing conditions			Tensile shear strength (MPa)		Characteristics
		Initial strength	Functiona l strength	Final strength	1.6mm	6mm	
02 rapid	12.000	12 min	24h	72h	18	16	Casting of small hollows
03 rapid	15.000	11 min	2h	24h	13	16	Bonding of small components
03 rapid thix	38.000	13 min	2h	24h	13	17	Bonding and sealing of housings
CR804	1.000	7.5h	24h	7d	12	-	Casting resin
CR805	800	-	-	7d	12	-	Casting resin
AD821	21.000	5.5	24h	7d	14	13	Casting of small components, bonding of large components
AD840	72.800	7h	16h	72h	23	27	Bonding and coating, Test for cytotoxicity acc. to ISO10993-5
AD848	400.000	7h	16h	72h	21	23	Bonding of large and small components
AD894	16.000	5h	7h	24h	19	31	Casting and bonding of components
AD895	90.000	5.5h	8h	24h	19	32	Bonding and coating, test for cytotoxicity acc. to ISO10993-5
AD897	pasty	6h	8h	24h	17	32	Coating and toweling

Other adhesive products in the DELO-DUOPOX serie are:

01 rapid, CR716, CR844

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## DELO-PUR – Two part cold cured polyurethane resin

### Technical Data



DELO's product range also includes DELO-PUR products. These are two-component polyurethanes that cure at room temperature. DELO-PUR products are filled in double chamber cartridges, and can easily be mixed and dispensed by means of the DELO-AUTOMIX system. DELO's polyurethanes are excellent for bonding metals, plastics, and elastomers.

#### Properties

- ✓ Good tough-elastic properties
- ✓ Excellent strength
- ✓ Suitable for larger bonding areas
- ✓ Tension-equalizing

#### Application areas

- ✓ Automotive
  - ✓ Mechanical engineering
  - ✓ Photovoltaics
- Further application areas
- ✓ Electrical engineering | Electronics

### Selection Chart

### Data sheets

Product	Viscosity (mPas)	Curing conditions			Tensile shear strength (MPa)		Characteristics
		Initial strength	Functiona l strength	Final strength	1.6mm	6mm	
9691	Pasty	90 min	6h	72h	12	13	Casting of sensors and small components, test for cytotoxicity acc. to ISO10993-5
9692	Pasty	30 min	2h	72h	16	23	Bonding of housings
9694	Pasty	2h	8h	72h	13	14	Bonding of housings
9895	pasty	7h	72h	72h	13	12	Bonding and sealing of plastic, test for cytotoxicity acc. to ISO10993-5
<b>Other adhesive products in the DELO-DUOPOX serie are:</b> AD948							

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## DELO-GUM – Silicone sealants & adhesives

### Technical Data



Silicones like DELO-GUM are available as one-component or two-component products. The one-component versions cure under the influence of humidity. Two-component DELO-GUM products cure within a few minutes without the need for air humidity. DELO-GUM products clearly give better bonding properties than the types of silicones used at home or in sanitary areas.

#### Properties

- ✓ Suitable for permanently elastic and highly flexible joints
- ✓ Extremely good resistance to chemicals
- ✓ Excellent weathering resistance and aging resistance
- ✓ Consistently high flexibility

#### Application areas

- ✓ Mechanical engineering
- Further application areas
- ✓ Electronics | Electrical engineering

### Selection Chart

### Data sheets

Product	Viscosity (mPas)	Curing conditions			Tensile strength (MPa)	Characteristics
		Processing temperature	Skin formation time	Curing speed		
SI480	17.000	+5°C to +35°C	10-20 min	2 mm / 24 h	0.2	Neutrally cross linking, low-viscous, flow able for applications in electronics
3597	140.000	+5°C to +35°C	5 min	2 mm / 24 h	1.6	Self-leveling, for applications in electronics
3599	pasty	+5°C to +35°C	8 min	2 mm / 24 h	1.2	Steady, contains fungicide, for applications in electronics and for sealing joints
3695	80.000	+5°C to +35°C	5 min	2 mm / 24 h	2.5	Resistant to high temperatures, low-viscous, flow able
3697	350.000	+5°C to +35°C	10-20 min	2 mm / 24 h	5	Very high bond strength, self-leveling
3699	pasty	+5°C to +35°C	5 min	2 mm / 24 h	3	Resistant to high temperatures, steady

Other adhesive products in the DELO-GUM serie are:

2355

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## DELO-ML – Anaerobic adhesives

### Technical Data



DELO-ML are one-component adhesives that cure under exclusion of air (anaerobic curing) and simultaneous contact to metal ions. They are predominantly used to secure screws, seal threads and surfaces, and bond coaxial metal components (shaft-to-hub joints, bearings, sockets). Furthermore, products with additional light or UV curing mechanisms are available. By exposing these DELO-ML materials to visible light or UV light, adhesive in edge areas can be cured fast. This is necessary to fix components within seconds, or to bond non-metals

Properties	Application areas
<ul style="list-style-type: none"> <li>✓ One-component, simple processing</li> <li>✓ Anaerobic-curing under simultaneous catalytic influence of metal ions</li> <li>✓ Products with additional UV/light curing mechanism available</li> <li>✓ Various strength classifications from removable to high-strength</li> <li>✓ Flexible, impact-resistant and tension-equalizing products available</li> <li>✓ Excellent resistance to elevated temperatures and media</li> <li>✓ Normal temperature range of use from -60 °C to 200 °C</li> </ul>	<ul style="list-style-type: none"> <li>✓ Automotive</li> <li>✓ Consumer electronics</li> <li>✓ Mechanical engineering</li> </ul> <p>Further application areas</p> <ul style="list-style-type: none"> <li>✓ Electronics</li> </ul>

Selection Chart				Data sheets	
Product	Viscosity (mPas)	Max. gap filling capacity (mm)	Compression shear strength (MPa)	Tensile strength (MPa)	Characteristics
5149	1.000 thix	0.25	3	Not determined	Easy to remove, securing of all threads
5198	pasty	< 0.3	5	Not determined	Easy to remove, sealing of surfaces, run-resistant
5228	300	0.13	16	Not determined	Removable threaded connections up to M10
5249	1000 thix	0.25	15	Not determined	Multi-purpose sealing of all threads, sealing of pipes, authorized for gas-operated installations
5298	Paste	< 0.3	15	Not determined	Seal of surfaces, run-resistant
5327	300	0.13	33	15	Fast, increased temperature stability, secure bonding even on slightly oily surfaces
UB160	10.000	0.25	40	14	Fast, difficult to remove, specific high-viscous setting
DB135	1.200	0.25	40	16	Fast, high-strength, for flat bonding, light curing possible, flexible, tension-equalizing
DB136	1.200	0.25	40	16	Fast, high-strength, for flat bonding, light curing possible, tension-equalizing, fluorescent color for adhesive detection
DB180	17.000	0.25	40	14	Fast, high-strength, specific high-viscous setting, for flat bonding, light curing possible, tension-equalizing, fluorescent color for adhesive detection
DB133	700	0.25	28	14	Highly flexible, impact-resistant, equalizes tensions very well, for flat bonding, UV curing possible
<b>Other adhesive products in the DELO-ML serie are:</b>					
DB154					
DELO-QUICK 5002		Activator, spray can 150ml.			
DELO-QUICK 5006		Activator, tin 1000ml.			

### Contact:

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DELO is a world-leading manufacturer of industrial adhesives and specialist in the field of high-tech adhesive processes for technical applications

## Siko –Thread Locker

### Technical Data

Siko Thread Locker and sealing products are single component, solvent free products that cure in the absence of air and in the presence of metal ions. Siko Thread Locker lock studs, nuts, screws and any threaded fasteners. Siko Sealing is designed for the sealing and locking of metal fittings and pipes. The adhesive prevents loosening caused by vibration, mechanical and thermal shock. The Thread Locker products are divided into high strength (Red) and (Blue) medium strength and are available in 50ml. and 250ml. bottles. The Sealing product (Yellow) are available in 50ml. bottles.

#### Properties

- ✓ Wide variety of viscosities and strengths
- ✓ Specifically designed for use on all standar thread designs to prevent loosening due to vibration, thermal expansion and to provide corrosion resistant
- ✓ Different packages sizes

#### Application areas

- ✓ Automotive
- ✓ Consumer electronics
- ✓ Mechanical engineering

Product	Type	Viscosity (mPas)	Curing time	Torgue strength break (Nm)	Torgue strength (Nm)	Temperature range
SIKO ML 5243	Blue	1.200~3.000	10~15 min	20	7	- 54°C~150°C
SIKO ML 5371	Red	400~600	15 min	26	36	- 54°C~150°C
SIKO ML 577	Yellow	90.000	240 min	11	6	- 54°C~150°C

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## DELO-CA – One part cyanoacrylates

### Technical Data



Cyanoacrylates are one-component adhesives that cure at room temperature. Ideal curing conditions are given at a relative humidity of 40 to 70 %. Components can be fixed in just seconds thanks to the adhesives' high reaction speed. After extremely fast curing, the components bonded cannot be adjusted anymore after joining. Therefore, cyanoacrylates are excellent for bonding small bonding areas.

#### Properties

- ✓ Fast fixing in just seconds
- ✓ High-strength bonding of a great variety of materials
- ✓ Easy handling and trouble-free dispensing

#### Application areas

- ✓ Automotive
  - ✓ Consumer electronics
- Further application areas
- ✓ Electronics | Plastic

### Selection Chart

### Data sheets

Product	Viscosity (mPas)	Max. gap filling capacity (mm)	Curing time until initial strength	Tensile strength (MPa)	Characteristics
2106	35	0.03	3-8 sec	18	Especially suitable for metal and rubber to metal
2153	2.000	0.1-0.2	5-10 sec	20	Multi-purpose, high-viscous, bridges gaps up to 0.2mm
2219	240	0.04	5-10 sec	17	Special type for rubber, such as EPDM, viton, foam rubber, medium-viscous
2229	300	0.05	15-25 sec	17	Multi-purpose, also bridges smaller unevenness's, delayed reaction
2256	3.000	0.1-0.2	8-15 sec	18	Multi-purpose, high-viscous, bridges gaps up to 0.2mm
2348	1.000	0.1	20-30 sec	13	Odorless, low efflorescence, not classified as hazardous
2505	20	0.03	5-10 sec	17	Special type for rubber, such as EPDM, viton, NBR, CR, SBR and NR, very thin
2725	280	0.05	10-15 sec	14	Multi-purpose, also bridges smaller unevenness's
2902	15	0.02	10-15 sec	14	Very thin, excellent capillary effect
2905	45	0.03	5-10 sec	14	Multi-purpose, low efflorescence

#### Other adhesive products in the DELO-CA serie are:

DELO-Quick 2002	Activator, spray can 150ml.
DELO-PRE 2005	Primer for difficult to bond plastics, bottle 100ml

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## Siko – Superglue

### Technical Data



This series of Siko cyanoacrylate adhesives is available in many viscosities, bonding speed and functionalities for you to choose from. Available in 20g, 50g and 500g bottle to 20kg bulk.

Properties	Application areas
<ul style="list-style-type: none"> <li>✓ Can be applied to various materials and gaps</li> <li>✓ Long shelf life</li> <li>✓ High viscosity for use on vertical surfaces</li> </ul>	<ul style="list-style-type: none"> <li>✓ Electrical components</li> <li>✓ Automotive applications</li> </ul>

Product	Type	Viscosity (mPas)	Curing time	Gap fill (MM)	Shear strength-tensile (Kg/cm <sup>2</sup> )	Temperature range
SIKO CA 2400	Ultra thin	2-5	Fast	0.1270	220	-50°C to 80°C
SIKO CA 2401	Thin	75-125	Medium	0.1270	220	-50°C to 80°C
SIKO CA 2403	Medium	300-500	Medium	0.2032	220	-50°C to 80°C
SIKO CA 2407	Thick	700-1000	Medium	0.2032	220	-50°C to 80°C
SIKO CA 2412	Extra thick	1200-1500	Slow	0.2032	220	-50°C to 80°C
SIKO CA2424	Ultra thick	2200-3000	Slow	0.2032	220	-50°C to 80°C

SIKO CA Activator	Activator, spray can 150ml.
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## DELO-MAFLEX – 1-component methyl methacrylate

### Technical Data



No-Mix adhesive, flexible construction adhesive. For high-strength and tension-equalizing bonding of metal, plastic, glass, wood, fabric and ceramic.

#### Processing:

- ✓ Supplied ready for use and can be processed well from the original container.
- ✓ Apply activator and resin separately.
- ✓ First, apply the activator onto the less porous surface very sparingly, apply the resin onto the second component.
- ✓ The resin forms a skin on the surface within 5 min, which can impair the bonding. Speedy processing is necessary.
- ✓ The product is distributed over the entire joining area through pressing the component during joining.
- ✓ After joining, the components should be fixed until the adhesive reached firmness to touch.

Properties	Application areas
<ul style="list-style-type: none"> <li>✓ Two-component</li> <li>✓ Excellent strength</li> <li>✓ High-strength</li> </ul>	<ul style="list-style-type: none"> <li>✓ Automotive applications</li> <li>✓ Mechanical engineering</li> <li>✓ Metal</li> </ul>

Product	Type	Color	Viscosity (mPas)	Curing time until initial strength	Tensile shear strength (MPa)	Temperature range
DELO-MAFLEX 8193	Resin	Yellowish	30.000	5 min (with aktivator)	25	-55°C to +100°C
DELO-QUICK 8003	Aktivator	Yellow	70			

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## SIKO – 2-component methyl methacrylate

### Technical Data



Properties	Application areas
<ul style="list-style-type: none"> <li>✓ Bonding of rigid materials such as steel, metal and hard plastics</li> <li>✓ S1600 for bonding two same materials</li> <li>✓ S3000 for bonding two different materials</li> </ul>	<ul style="list-style-type: none"> <li>✓ The employability of SIKO MMA adhesives is the hole industry landscape.</li> <li>✓ (rapid) Prototyping</li> <li>✓ Construction</li> <li>✓ Interior construction</li> <li>✓ Architecture</li> </ul>

Product	Type	Viscosity (mPas)	Curing time	Gap fill (MM)	Shear strength-tensile (N/mm <sup>2</sup> )	Temperature range
SIKO S1600-5min	Ratio 1:1 Milky	175.000	15-min	5mm	30	-55°C to +120°C Short term +140
SIKO S1600-30min	Ratio 1:1 Milky	175.000	60-min	5mm	30	-50°C to +120°C Short term +140
SIKO S3000-5min	Ratio 10:1 Dark gray	130.000	15-min	10mm	22	-50°C to +150°C Short term +180
SIKO S3000-30min	Ratio 10:1 Dark gray	130.000	45-min	10mm	22	-50°C to +150°C Short term +180

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## SIKO – 2-component epoxy adhesives

### Technical Data



Properties	Application areas
<ul style="list-style-type: none"> <li>✓ Universal epoxy adhesive</li> <li>✓ Also suitable as a casting compound</li> </ul>	<ul style="list-style-type: none"> <li>✓ Aerospace</li> <li>✓ Automotive</li> <li>✓ Marine industry</li> <li>✓ Civil engineering</li> <li>✓ Mould makers</li> <li>✓ Electrics isolation</li> <li>✓ Potting and encapsulation</li> </ul>

Product	Type	Viscosity (mPas)	Curing time	Gap fill (MM)	Shear strength-tensile (Kg/cm <sup>2</sup> )	Temperature range
SIKO S3005	Ratio 1:1 Clear	50.000	5-min	2mm	20	-40°C to 80°C Short term +100
SIKO S3030	Ratio 1:1 Clear	40.000	30-min	2mm	20	-40°C to 60°C Short term +100

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## SIKO – 2-component polyurethane adhesives

### Technical Data



Properties	Application areas
<ul style="list-style-type: none"> <li>✓ Polyurethane adhesives provide extremely strong bonding. Even before the adhesive dries and seals completely, the initial bond is strong enough that clamps and other types of securing instruments are unnecessary. This makes manufacturing and construction processes both simpler and cheaper</li> <li>✓ Polyurethane adhesives tend to be very flexible and durable, and they provide good impact resistance</li> <li>✓ They vary in degree of resistance to heat and chemicals, as well as in the level of their bulk flexibility</li> </ul>	<ul style="list-style-type: none"> <li>✓ For structural or cosmetic repair of plastic-bumpers, fenders, spoilers, lamp-housings, radiators etc. in the automotive- and other industries where quick cure time on almost any type of plastic material is needed. Also bonds to wood, metal, plastic, fiberglass, ceramic and substrates.</li> </ul>

Product	Type	Viscosity (mPas)	Curing time	Gap fill (MM)	Shear strength-tensile (Kg/cm <sup>2</sup> )	Temperature range
SIKO S6000-1min	1-min	50.000	1-min	5mm	8.0	-40°C to 120°C Short term to 140°C
SIKO S6000-5min	5-min	50.000	5-min	5mm	8.0	-40°C to 120°C Short term to 140°C

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## SIKO – 1-component adhesives and sealants

### Technical Data



Properties	Application areas
<ul style="list-style-type: none"> <li>✓ High quality adhesives for a clean and efficient production process</li> <li>✓ A wide range of adhesives for varied applications</li> <li>✓ Adhesives and sealants that meet the highest standards</li> <li>✓ Advanced solutions for adhesion and sealing</li> <li>✓ Thanks to our wide range and the useful specification service, you can always find the right adhesive or sealants for indoor and outdoor use.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Foam processing</li> <li>✓ Mattress</li> <li>✓ Furniture</li> <li>✓ Road transport</li> <li>✓ Infrastructure &amp; civil engineering</li> <li>✓ (Bio)chemical industry</li> <li>✓ Home building &amp; Utility construction</li> <li>✓ PVC</li> <li>✓ Yacht &amp; shipbuilding</li> </ul>

Product	Open time	Tensile strength	Hardness Shore A	Elongation at break	Characteristics
<b>MS polymer</b>					
Sabatack 720	14 min	2.2N/mm <sup>2</sup>	50	300%	1-component MS polymer-based sealant and light adhesive. Its primary use is to seal seams, overlaps, joints and cracks
Sabatack 750	12 min	2.6N/mm <sup>2</sup>	55	330%	1-component MS polymer-based construction adhesive and sealant. Its primary use is for easy, elastic bonding of frames, profiles, plates, etc. with high end strength. Also suitable for sealing seams, overlaps and joints.
Sabatack 750XL	30 min	2.6N/mm <sup>2</sup>	55	330%	1-component, MS polymer-based construction adhesive and sealant with a long open time. Its primary use is for easy, elastic bonding of frames, profiles, plates, etc. with high end strength. Also suitable for sealing seams, overlaps and joints. Can be painted wet-on-wet.
Sabatack 760XLHT	10 min	3.0N/mm <sup>2</sup>	60	330%	is suitable for bonding and sealing mineral glass and synthetic windows. It is a 1-component, elastic, (air) moisture-curing, MS polymer-based adhesive with extra high initial tack (sag-resistant) and a high end strength.
Sabatack 780	10 min	3.0N/mm <sup>2</sup>	55	350%	is a stable 1-component MS polymer-based construction adhesive and sealant. Its primary use is for elastic bonding of frames, profiles, plates, etc. with high green strength (stability) and high end strength. Also suitable for sealing seams, overlaps and joints.
OTTOCOL L M501	45 min	2.8 N/mm <sup>2</sup>	n.a.	170%	transparent
<b>Polyurethane (PU)</b>					
Sikaflex 221	45 min	1.8N/mm <sup>2</sup>	40	500%	is a high-quality multi-purpose non-sag 1-c polyurethane sealant that cures on exposure to atmospheric humidity to form a durable elastomer.

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## DELO-Cleaners – DELOTHEN EP, DELOTHEN NK1 & IPA

### Technical Data

Properties	Application areas
<ul style="list-style-type: none"> <li>✓ Cleaning surfaces</li> <li>✓ Surface preparation</li> <li>✓ Cleaning of uncured adhesive residues</li> </ul>	<ul style="list-style-type: none"> <li>✓ Automotive applications</li> <li>✓ Consumer electronics</li> <li>✓ Mechanical engineering</li> <li>✓ Metal processing</li> <li>✓ Plastic</li> </ul>

### DELOTHEN EP



Preferably for the cleaning of equipment or systems contaminated with epoxy resin components. Cleaning must be carried out before complete curing of the epoxy resins.  
Cleans metal, glass, ceramic, rubber and plastic.

**Packing unit:**  
✓ 1 tin of 1000ml

### DELOTHEN NK



For the cleaning of components and the removal of grease from surfaces, especially for the preparation of bonding surfaces.  
Cleans metal, glass, ceramic, rubber and plastic

**Packing unit:**  
✓ DELOTHEN NK1, 1 spray can of 400ml  
✓ DELOTHEN NK1, 1 tin of 4800ml  
✓ DELOTHEN NK3, 12 spray can of 400ml

### IPA



Isopropyl Alcohol (IPA) for the cleaning of components and the removal of grease from surfaces, especially for the preparation of bonding surfaces.  
Cleans metal, glass, ceramic, rubber and plastic

**Packing unit:**  
✓ 1 jerry can of 5000ml

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## DELO-Equipment – LED lamps

### Technical Data

DELOLUX 20	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ Lifetime exceeding 20,000 hours</li> <li>✓ Consistent light intensity throughout the flood lamp's lifetime</li> <li>✓ Irradiation area can be expanded on the x- and y-axis</li> <li>✓ Very even distribution of light even on large areas</li> </ul>	<ul style="list-style-type: none"> <li>✓ Glass bonding</li> <li>✓ Display bonding (sizable, low-tension curing)</li> <li>✓ Thicker, flat adhesive layers</li> <li>✓ Small component bonding with short cycle times</li> <li>✓ Microswitch bonding</li> <li>✓ Bonding of mini-loudspeakers</li> </ul>
DELOLUX 202	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ Lifetime exceeding 20,000 hours</li> <li>✓ Consistent light intensity throughout the flood lamp's lifetime</li> <li>✓ Irradiation area can be expanded on the x- and y-axis</li> <li>✓ Very even distribution of light even on large areas</li> </ul>	<ul style="list-style-type: none"> <li>✓ Glass bonding</li> <li>✓ Display bonding (sizable, low-tension curing)</li> <li>✓ Thicker, flat adhesive layers</li> <li>✓ Small component bonding with short cycle times</li> <li>✓ Microswitch bonding</li> <li>✓ Bonding of mini-loudspeakers</li> </ul>
DELOLUX 50	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ The right LED head for every application</li> <li>✓ More than 20,000 h lifetime can be achieved</li> <li>✓ Independent irradiation of multiple bonding areas</li> <li>✓ Easy integration into production systems.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Fixing of coil wires</li> <li>✓ Securing of the position of individually adjusted components</li> <li>✓ Electronic casting with relatively thin adhesive layers and areas measuring several square millimeters in size</li> <li>✓ Lens bonding</li> </ul>
DELOLUX 80	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ Low operating cost (low power consumption, low cost for maintenance and spare parts)</li> <li>✓ Controllable light intensity: continuously and flexibly</li> <li>✓ Short cycle times for high occupational and process safety</li> <li>✓ Option of continuous irradiation</li> </ul>	<ul style="list-style-type: none"> <li>✓ Bonding of mini loudspeaker membranes</li> <li>✓ Fast fixing of adjusted components</li> <li>✓ Casting of pins</li> <li>✓ Sealing of housings</li> <li>✓ Bonding of printed circuit boards into housings</li> </ul>
DELOLUX 820	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ Evenly distributed intensity and homogeneous curing over the entire irradiation line</li> <li>✓ Stable light power at a constant temperature for maximum process reliability</li> <li>✓ Easy-to-exchange lamp head</li> <li>✓ Maximum output in in-line processes</li> </ul>	<ul style="list-style-type: none"> <li>✓ Smart card: Encapsulation of IC modules</li> </ul>
DELOLUX-control	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ LED 9 mm detector head (DELOLUX 80, DELOLUX 20)</li> <li>✓ LED 1 mm detector head (DELOLUX 50)</li> </ul>	<ul style="list-style-type: none"> <li>✓ For measuring the intensity of LED curing lamps</li> </ul>

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## DELO-Equipment – UV lamps


### Technical Data


TL lamp	Technical Properties
	<ul style="list-style-type: none"> <li>✓ For curing UVA and light curing adhesives</li> <li>✓ Work length 570 mm</li> <li>✓ Voltage: 230 volts</li> <li>✓ Output: 45 watt</li> </ul>

UV led zaklamp	Technical Properties
	<ul style="list-style-type: none"> <li>✓ Nite Hunter with UV 400nm led</li> <li>✓ 3,7V / 2600mAh LI-ION Rechargeable battery</li> <li>✓ AC charger, 3 hours charging (max)</li> </ul>

SIKO Hand-held UV LED lamp	Technical Properties
	<ul style="list-style-type: none"> <li>✓ Power Supply, 110-230 V / 50-60 Hz</li> <li>✓ Intensity, 365 nm: 130 mW/cm<sup>2</sup> or 405 nm: 300 mW/cm<sup>2</sup></li> <li>✓ Dimension of output window, 137 * 75 mm</li> <li>✓ Weight lamp unit, 1.8 KG</li> <li>✓ Power input, 64W</li> </ul>

DELOLUX 06	Technical Properties
	<ul style="list-style-type: none"> <li>✓ DELOLUX06 is not available anymore. We can only supply spare parts. The alternative UV-lamp is the DELOLUX 20</li> </ul>

DELOLUX 04	Technical Properties
	<ul style="list-style-type: none"> <li>✓ DELOLUX04 is not available anymore. We can only supply spare parts. The alternative UV-lamp is the DELOLUX 50</li> </ul>

DELOLUX 03	Technical Properties
	<ul style="list-style-type: none"> <li>✓ DELOLUX03 is not available anymore. We can only supply spare parts. The alternative UV-lamp is the DELOLUX 20</li> </ul>

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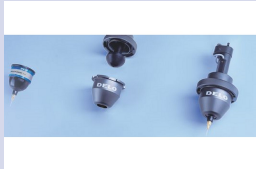
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## DELO-Equipment – Dispensing valve


### Technical Data

DELO-DOT PN2 micro dispensing valve can supply up to 300 glue drops per second!

DELO dot pn2	Technical Properties
	<ul style="list-style-type: none"> <li>✓ The micro dispensing valve can supply up to 300 glue drops per second!</li> <li>✓ Modular design, easy to disassemble and easy to clean</li> <li>✓ Optimal integration, rotatable media supply, compact design, low weight</li> <li>✓ Robust actuator</li> </ul>

DELO dot pn2 + DELO-FLEXCAP	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ The micro dispensing valve can supply up to 300 glue drops per second!</li> <li>✓ Modular design, easy to disassemble and easy to clean</li> <li>✓ Optimal integration, rotatable media supply, compact design, low weight</li> <li>✓ Robust actuator</li> </ul>	<ul style="list-style-type: none"> <li>✓ Available for DELO-DUALBOND DELO-KATIOBOND DELOMONOPOX</li> </ul>

Pinch valve	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ Precise dispensing</li> <li>✓ Easy handling</li> <li>✓ Can be integrated into serie processes with high cycle frequency</li> <li>✓ Luer-lock connector for all standard dispensing needles</li> </ul>	<ul style="list-style-type: none"> <li>✓ For low viscous to pasty, one-component media such as DELO-CA DELO-ML DELO-GUM DELOMONOPOX</li> </ul>

Diaphragm valve	Technical Properties	Application areas
	<ul style="list-style-type: none"> <li>✓ Precise dispensing</li> <li>✓ Easy handling</li> <li>✓ Can be integrated into serie processes with high cycle frequency</li> <li>✓ Luer-lock connector for all standard dispensing needles</li> </ul>	<ul style="list-style-type: none"> <li>✓ For low-viscous, one-component and light-curing media such as DELO-PHOTOBOND DELO-KATIOBOND</li> </ul>

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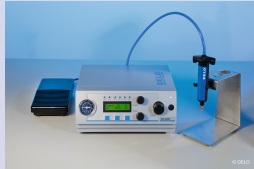
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## DELO-Equipment – dispensing-system

### Technical Data

#### DELOMAT



#### Technical Properties

- ✓ Flexible dispensing control unit for semi- or fully automated work stations
- ✓ Universal adhesive dispensing from pressure tanks, Euro or small cartridges
- ✓ Various dosing times can be set at the dispensing controller: for fixed settings or external control over individual cycles
- ✓ No unwanted dripping thanks to a regulated vacuum that keeps low-viscosity products in small cartridges

#### DELO-XPRESS pressure tanks



#### Technical Properties

- ✓ Pneumatic conveyance of low-viscous to pasty, one-component media
- ✓ Fast and easy handling
- ✓ Easy control by DELOMAT dispensing units

#### DELO-XPRESS dispensing guns



#### Technical Properties

- ✓ For easy dispensing of DELO adhesives
- ✓ For 50 cc and 200 cc double chamber cartridges
- ✓ For 1 : 1 and 2 : 1 double chamber cartridges
- ✓ Manual and pneumatic operation

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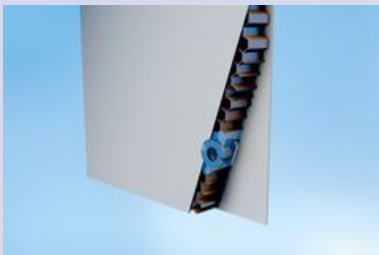
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## DELO-Application areas – Aerospace

### Technical Data



#### Doors and door frame covers



DELO adhesives are already used in this area to bond sandwich structures to thin plastic panels.

As adhesive joining does not damage the material, the load-bearing stiffness of the sandwich structures remains unreduced. The adhesives have tough-elastic properties and also equalize tensions well.

#### Displays



Today, no aircraft can be imagined without displays. They are used in in-flight entertainment and the cockpit.

Previously, the air gap between touch panel and display led to undesirable reflections. Thanks to the new optically clear DELO adhesives, these reflections can be reduced to a minimum (see picture).

#### Seats



DELO adhesives provide excellent strength and high peel resistance. Therefore, they are used in constructive seat bondings and for veneers. Unlike other joining methods, bonding gives creative freedom for design and appearance.

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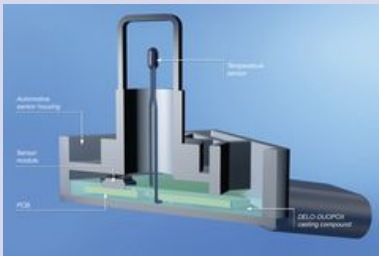
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## DELO-Application areas – Automotive

### Technical Data



### Automotive electronics



Adhesives for chip and sensor casting in the automotive industry must withstand extreme chemical stress and elevated temperatures from -65 °C to +200 °C.

Both DELOMONOPOX (1C) and DELO-DUOPOX CR (2C anhydrides) unify excellent adhesion, optimally adjusted flow properties and variable curing parameters. They reliably retain their properties even after years of use.

When casting sensors, the sensor module is cast on the printed circuit board in a housing. It is essential that the casting protects the sensor against chemicals, such as gasoline, diesel, oils and cleaners. The highly reliable 2C anhydrides are especially suitable for this task.

When encapsulating chips (COB), SMD components are Dam&Fill-encapsulated. Several adhesive beads are stacked as "Dam" and subsequently "Fill"-ed. The finished encapsulation protects the component or the sensitive electronic parts from environmental influences.

### Automotive cameras



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### Sensor bonding



A multitude of sensors are used in cars. These include position sensors, speed sensors, concentration sensors, pressure sensors, fill level sensors, and many more. Bonding sensors requires special adhesives. They must protect the sensor from the environmental conditions prevailing at the point of use, such as elevated temperatures, high pressure, or aggressive media. The open contact areas of the housing must be reliably covered and protected from corrosion.

DELO's light-curing adhesives enable the reliable sealing of microswitches, relays and connectors, fixing of electronic components, and bonding of housing parts. Applications in the automotive industry in particular require fast bonding processes combining short cycle time with reliable process control. DELO's light-curing adhesives are excellent for this purpose: Fast curing within seconds by exposure to light ("curing on demand") enables immediate in-line quality control. This is how component defects can be detected promptly and necessary remedial actions can be taken, saving time and cost.

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## DELO-Application areas – Consumer electronics

### Technical Data



#### MEMS packaging

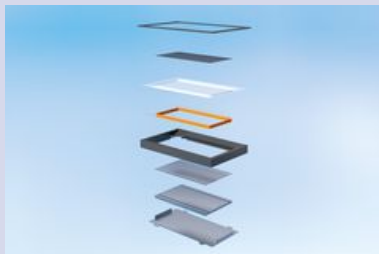


Microelectromechanical systems (MEMS) are found in many everyday products. These tiny components are used in many fields of applications.

In particular, mobile phones and automotive applications contain numerous MEMS elements.

DELO's adhesives for MEMS packaging are easy to process, highly flexible and have an outstanding die shear strength.

#### Mini-loudspeaker



Every cell phone is expected to deliver good acoustic quality. Even the most basic phones meanwhile produce good audio quality and are suitable for listening to music. The highest-end cell phones are equipped with up to three mini-loudspeakers. In close cooperation with technology and market leaders in the mini-loudspeaker industry, DELO has developed modern adhesives and curing equipment to respond to the new challenges in this industry.

Our light-curing adhesive DELO-PHOTOBOND connects, as an example, membrane to coil, cover to membrane, etc. Furthermore, they are adequate for membrane damping, wire fixing, contact sealing and speaker box bonding. DELOMONOPOX or DELO-ML is used for bonding the magnet system.

##### Adhesive properties

- ✓ High adhesion to many materials such as metal, ferrite and many plastics
- ✓ Reliability under harsh conditions: Very good resistance to humidity and elevated temperatures
- ✓ Maximum preservation of acoustic properties
- ✓ Easy and fast dispensing with standard equipment
- ✓ Very fast curing (1 s) with DELO light curing equipment
- ✓ Passing of high-power speaker qualification tests

#### Touch panel



The penetration of touch panels in the cell phone market is forecasted to reach more than 40 % in the near future. The introduction of new tablets will cause an even larger increase in the use of this technology. The touch display is a "sandwich" of many active layers that needs to be efficiently assembled.

This is due to high-performance criteria issues such as light transmission, impact resistance, and environmental resistance. DELO has developed new optically clear light-curing liquid adhesives with ideal properties for cell phones.

##### Adhesive properties

- ✓ Optically clear, no yellowing under sunlight
- ✓ Highly transparent
- ✓ Enhanced shock and vibration performance
- ✓ Prevents condensation and fogging
- ✓ High flexibility to allow low-stress bonding
- ✓ Low viscosity > Easy dispensing and joining without bubbles

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## DELO-Application areas – Display

### Technical Data



### Optical bonding



The success of iPhone and iPad [iPhone and iPad are trademarks of Apple Inc., registered in the U.S. and other countries] are triggering a boom in touch panel displays. The touch panels are often attached in front of the display. The bonding gap in between causes undesired reflections and limited readability in direct sunlight.

Bonding the touch panel directly to the display can circumvent this effect. DELO's new adhesive family of optically clear adhesives offer multiple possibilities. It is also possible to bond cover glasses of industrial displays, for example, to protect them from extreme environmental conditions or vandalism. Optionally, adhesive below potentially existing shadowed areas can also be cured with high reliability, such as when bonding black print to cover glass.

### E-Paper sealing



E-readers and e-books on the basis of electrophoretic displays are experiencing increasing popularity. Their unique feature is a high-level reading quality that comes very close to that of printed paper, and have a long battery life of several weeks at the same time.

In order to make sure that the readers are fully functioning even at elevated temperatures, or in climates of high humidity or extreme dryness, the displays must be sealed by adhesive. Especially for this purpose, DELO has developed a range of adhesives with low permeation and disparate flexibilities adjusted to the specific application. The adhesives' special feature is that they not only can be UV-cured, but if necessary they can also be cured by exposure to visible light, for example if the adhesive is supposed to be cured through UV-blocked foils. The overall solution of disparate light curing mechanisms in combination with the newly developed DELOLUX 20 LED area lamp provides the customer with an efficient, fast and economical alternative to conventional systems for the encapsulation of e-paper displays.

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## DELO-Application areas – Glass

### Technical Data



### Hinge bonding at Duscholux



The Swiss company Duscholux has already been using light-curing adhesives for mixed glass bondings for many years. The company is the world market leader in shower enclosures and acrylic tubs. In addition, Duscholux creates room concept solutions for nearly any bathroom size and construction requirements. The example illustrated describes how stainless steel hinges are bonded to glass partition walls to build up shower enclosures. Several alternative joining methods had been tested in advance as well. Finally, bonding with light-curing adhesives could convince the customer with respect to process reliability and bonding technology and with manageable financial investment.

Therefore, one of DELO's LED-light-cured adhesives is used to produce the latest generation of glass shower enclosures. The adhesive used gives high strength and has an excellent long-term resistance. At the same time, its transparency makes it suitable for bondings with high requirements on an attractive appearance as it is transparent after curing and remains so.

While the hinge of conventional shower enclosures is screwed into the glass plate, the bonded door hinge provides practical and aesthetical features. For instance, the shower enclosure has flush inner surfaces without protruding superstructures or recesses in the glass plate. This results in easy cleaning of the inner glass surfaces. "We decided on bonding as a joining method in order to get a product with high-quality design", says Guido Riegger, Development Manager at Duscholux.

Duscholux uses DELO's LED area modules to cure the light-curing adhesive. The decision in favor of LED technology was based on the possibility to control the intensity and the irradiation time in an automated process. As a consequence, the LED lamp can be switched off after irradiation, which is particularly user-friendly.

The LED lamp's wavelength and the adhesive used have been optimally harmonized. When applying a defined LED lamp intensity and wavelength, the adhesive gives its best performance and satisfies all of Duscholux's high requirements on this bonded connection. Curing takes no longer than two minutes and the components can be loaded immediately afterwards.

Even in terms of occupational health and safety, the use of LED lamps is uncritical as no radiation in the UVB and UVC range is generated. Furthermore, LED lamps do not form harmful ozone that would have to be exhausted. Protective measures are limited to a simple glare protection in case of direct sight contact. In addition, the heat input at the component is reduced to a minimum, which might be of importance when bonding temperature-sensitive substrates.

It is the uniquely low investment that the customer appreciates about LED technology. He does not have to change the bulbs with great efforts all the time as is necessary when using conventional discharge lamps. The operation of LED lamps is much easier in this case

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## DELO-Application areas – Mechanical engineering

### Technical Data



### Bonding of electric motors



The engine developer and manufacturer ebm-papst bonds steel stators to aluminum housings. They use these assemblies in electric motors of the new modular ECCI drive series. These high-performance multi-pole drives reach a very high torque in a small amount of space.

The tension-equalizing adhesive used gives better strength in torque tests than the previously used product. Bonding with it could be successfully qualified as a reliable and durable joining method even at high torque.

The adhesive combines an elongation at tear of 30 % with a temperature range of use up to +180 °C. What is more, it has higher extruding forces and adheres very well to a smooth metal surface. Therefore, the complex process step of surface roughening can be omitted. In advance, numerous tests have been conducted in DELO's labs and by the customer. For example, the bonded electric motors were aged in temperature change tests (-40 °C to +120 °C, 15 cycles).

### Bonded storage and retrieval machine in high-bay warehouse



In collaboration with Gebhardt Fördertechnik and TU Kaiserslautern, DELO has developed a storage and retrieval machine made of steel, aluminum and fiber composite – called "Cheetah". It shows how structural bonding puts future technologies, such as light-weight construction, into practice in mechanical engineering and plant construction.

Special adhesives allow the use of standard profiles made of fiber composite completely bonded within the framework. This approach reduces weight and increases the moving dynamics in connection with high stiffness. In addition, less energy is consumed and wear-prone components get less stressed. This reduces operating expenses and increases availability.

### Bonding of magnets into stator housing



DELO's adhesives are used to bond magnets into the stator housing made of zinc-plated steel for electric motors. In this case, the DELOMONOPOX epoxy resin was chosen thanks to the strengths it achieves on magnet and zinc-plated steel.

In addition, the adhesives gives high impact resistance, equalizes tension, and can be used at temperatures up to +200 °C. One-component heat-curing epoxy resins are mainly used when bonding temperature-sensitive components. Since they also cure in thick layers, they are excellent to bridge gaps.

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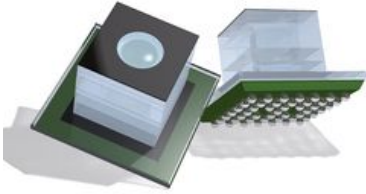
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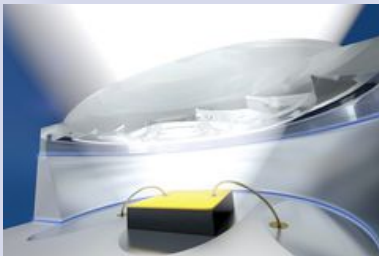
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## DELO-Application areas – Optoelectronics

### Technical Data



#### LED lens bonding



Nowadays, LED illumination is used all over the world. Their key pros: They save energy and costs, and have a long lifetime. Therefore, DELO has developed adhesives which are advantageous especially in terms of outgassing, thermal resistance and UV stability.

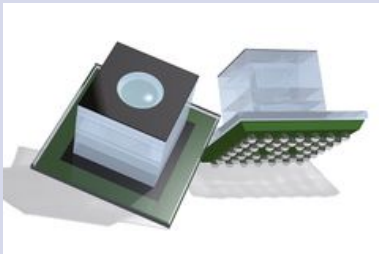
##### Applications

- ✓ Lens bonding / flash lens bonding
- ✓ Bonding of protective glass covers for LED arrays

##### Properties

- ✓ High yellowing resistance
- ✓ Low outgassing
- ✓ Very low shrinkage
- ✓ Good adhesion to glass, ceramic, aluminum and plastic
- ✓ Halogen-free (IEC 61249-2-21)

#### Wafer level / micro-optics



For new and consistently improved products, such as mini-3D-cameras for mobile phone, beamers for smartphones and 3D screens, micro-optics are becoming more and more important. With newly developed, fast-curing and highly transparent imprint materials, DELO enables its customers to push forward these developments.

The lenses are produced by molding. Corresponding adhesives are also available for wafer bonding.

##### Applications

- ✓ UV replica processes and micro-lens imprint

##### Properties

- ✓ High yellowing resistance at elevated temperatures, especially in reflow processes
- ✓ Very high transmission in the visible range
- ✓ Low outgassing
- ✓ Very low shrinkage
- ✓ Excellent adhesion to glass with simultaneous debondability from punch materials
- ✓ Halogen-free (IEC 61249-2-21)

#### Mini-camera applications



High-resolution mini-cameras in mobile phones (compact camera modules) and cars (front and rear view cameras) will be key features of these two markets in the future.

DELO adhesives are especially adapted to these requirements and enable a highly accurate adjustment of the optical axis (active alignment) and high optical quality in the long term.

##### Properties

- ✓ Active alignment with high precision
- ✓ Fast UV fixation
- ✓ Low-temperature curing at less than +80 °C
- ✓ Halogen-free (IEC 61249-2-21)

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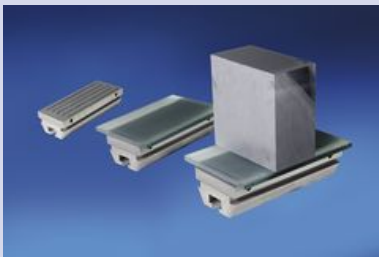
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## DELO-Application areas – Photovoltaics

### Technical Data



### Adhesives for wafer cutting



The increasing cost pressure on the photovoltaics market means that production processes must be optimized continuously. DELO's two-component RM compounds (ReMovables) are precisely tailored to the high requirements in the wafering process, and therefore make possible high output rates. To prepare the cutting process, the assembly plate, the loss plate or carrier, and the silicon ingots are bonded and fixed.

During wafering, the bonded silicon ingots are clamped into the wire saw by means of the assembly plate. Then they are cut into thin wafers. The adhesive must reliably fix the cut wafers to the loss plate. Afterwards, the wafers must be debonded from the loss plate without leaving any residue, for example, in baths of hot water or diluted acid. The adhesive must not contaminate the debonding bath or the silicon, but should adhere to the carrier.

#### Properties

- ✓ Nonylphenol-free
- ✓ High temperature stability and high bond strength on silicon, glass, polymer, steel, or aluminum
- ✓ Excellent resistance to glycol (slurry)
- ✓ Universal debonding in annealed media like water or diluted acids without leaving any residue

#### Advantages

- ✓ Excellent sawing properties for slurry and diamond wire saws
- ✓ Reliable fixing during cutting and very low silicon waste
- ✓ High process reliability
- ✓ Processing times and curing times tailored to the process
- ✓ No contamination of the silicon material during debonding

### Contacting of thin-film cells



Contacting of thin-film cells by conductive adhesives is a gentle conducting method and has numerous advantages over conventional methods like soldering and ultrasonic welding. The maximum curing temperature of the adhesives is +150 °C, which is significantly lower than the temperature during soldering.

The adhesives' tension-equalizing properties prevent mechanical tensions and reduce micro cracks and cell failure. DELO supplies customized products for various variants of thin-film modules.

#### Properties

- ✓ One-component and heat-curing
- ✓ 100 % solvent-free
- ✓ Easy handling and dispensing
- ✓ Fast curing
- ✓ Long processing time
- ✓ Reliable and permanent contacting
- ✓ Optimized for a wide variety of thin-film surfaces and structures (rigid, flexible)

#### Advantages

- ✓ Easy to integrate into existing production processes
- ✓ Reduction of the cycle time by single shot process option (lamination and adhesive curing in one step)
- ✓ Flexible material selection

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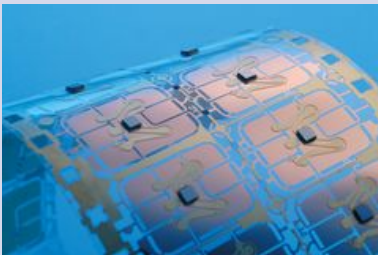
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## DELO-Application areas – RFID

### Technical Data



### Flip-chip



In the RFID flip-chip process, the adhesive has the task to reliably fix the microchip to the RFID antenna at a defined position. For this purpose, DELO supplies non-conductive die attach adhesives or anisotropic conductive adhesives. We are the market leader in adhesives for the flip-chip process in RFID applications.

The adhesive does not only take mechanical tasks, but also establishes the electrical contact. The product range was specifically developed for reliable contacting with short curing time in the production process.

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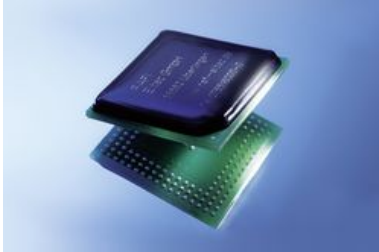
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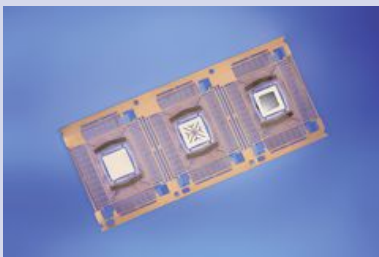
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## DELO-Application areas – Semiconductor

### Technical Data



#### Die attach

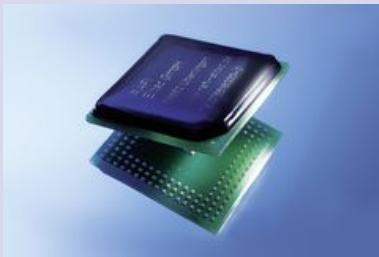


Die attach adhesives in leadframe packages require a high temperature resistance for lead-free soldering processes, good electrical and thermal properties, and the possibility of low-tension curing. DELO has adapted its products to exactly meet these requirements.

#### Possibilities of use

- ✓ Semiconductor leadframe products
- ✓ Die attach with low Young's modulus for MEMS packages
- ✓ Die attach for organic substrates

#### Encapsulants for the chip-on-board (COB) technology

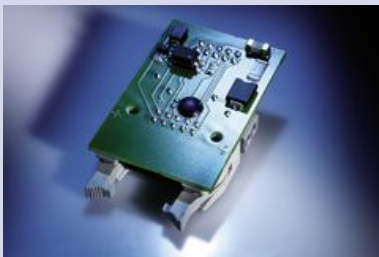


RAFI Eltec GmbH, Überlingen, Germany, uses the DELOMONOPOX anhydrides as Dam&Fill. For the assembly, solder deposits are attached to the bottom in the form of BGA ballings, followed by one-side SMD assembly. The SMD assemblies produced are subsequently Dam&Fill-encapsulated.

In this method, two beads of adhesive are circumferentially dispensed as "Dam" on top of each other, which are subsequently "Fill"-ed. For this purpose, a screw dispensing valve is used in order to ensure that the components are evenly dispensed. Afterwards, the components are laser-marked on the encapsulation that has been cured in an air convection oven at +150 °C for 20 min.

Adhesive processing is reliable, and planar, large-area encapsulation geometries are possible. In addition, the adhesive fulfills all requirements on solder resistance. The dispensing profile can easily be adjusted to the specific package geometry, enabling high flexibility in production. It also gives a very homogeneous processing behavior, protects the component resp. the sensitive electronic parts from environmental influences, and performs excellently in reliability qualification tests. The material's properties minimize the stress in the package. Thanks to the planar encapsulation, the component can be assembled just like a BGA module.

#### Sealing of sensors



The new anhydrides have proven successful in practice. These products are used in oil pressure sensors in cars. They cast the inside of the sensor and also seal the electrodes.

In comprehensive stress tests, the sensors casted with DELOMONOPOX proved to be completely tight. The tests included long-term storage at +150 °C, storage in ATF oil at +150 °C for 1000 h, 1000 cycles temperature shock at -40 / +150 °C, the VDA climate test, as well as customer-specific vibration tests and mechanical shock tests.

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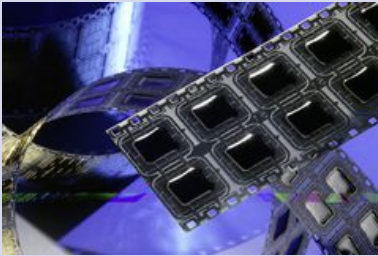
DELO is a world-leading manufacturer of industrial adhesives and specialist in the field of high-tech adhesive processes for technical applications

## DELO-Application areas – Smart Card

### Technical Data



### Opaque chip encapsulation with Dam&Fill® adhesives



UV-curing chip encapsulants are state-of-the-art in the chip card industry. A precondition for light curing is that the encapsulants transmit light. Increased safety requirements by which the chip is protected from unauthorized viewing and copying, results in the need for black encapsulants with high mechanical loading capacity. This is where UV-curing products reach their limits.

Therefore, DELO has developed Dam&Fill® encapsulants. The heat-curing adhesives are optically intransparent, provide a very high degree of mechanical protection, and are easy to process on existing encapsulation systems. DELO's Dam&Fill® compounds are absolutely opaque even in thin layers.

#### Advantages overview of black Dam&Fill® compounds:

- ✓ Enables short cycle times
- ✓ High mechanical stress values compared to conventional UV-curing encapsulants
- ✓ Easy to integrate into existing encapsulation systems

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## Application areas – Car (window) repair – part 1

### Technical Data



#### UV TL lamp, Prijs €250,00 ex BTW



De UV TL lamp is geschikt om langere lijmnaden uit te harden. De UV handlamp of UV buislamp kan men direct op het lichtnet aansluiten. De lamp bezit een degelijke kunststof behuizing en is uitermate geschikt om als mobiele handlamp te gebruiken.

Kenmerk:

- ✓ Lichtspectrum: witlicht
- ✓ Gebruikslengte: 570 mm
- ✓ Spanning: 230 volt
- ✓ Vermogen: 45 watt
- ✓ Handlamp inclusief voorschakelapparaat

#### UV led Zaklamp, Prijs €200,00 ex BTW



De UV led Zaklamp heeft een zwart geanodiseerde behuizing, is degelijk en is uitermate geschikt om als mobiele handlamp te gebruiken. Ook voor stof en vuildetectie.

Kenmerk:

- ✓ Lichtspectrum: 400 nm
- ✓ Stralingsoppervlakte: rond 100 mm
- ✓ Accu: 1x3,7V 2600mAh Li-ion
- ✓ Afmetingen: lengte 147,50mm
- ✓ Gewicht: 230 gram met accu
- ✓ Lader: snellader Li-ion
- ✓ Intensiteit op 100 mm afstand: 5 mW/cm<sup>2</sup>
- ✓ Intensiteit op 10 mm afstand: 20 mW/cm<sup>2</sup>

#### SIKO Hand-held UV LED lamp, Prijs €1.850,00 ex BTW



De handbediende UV lamp is gemakkelijk te vervoeren, ergonomisch ontworpen en ideaal voor mobile gebruik. De intensieve bestraling zorgt voor een betrouwbare resultaat binnen enkele seconden. Een homogene intensiteitverdeling wordt gegarandeerd door de LED's. De typische levensduur van een LED lamp is meer dan 20.000 uur. De Siko hand-held UV LED lamp kan zo vaak als nodig worden in- en uitgeschakeld.

Kenmerk:

- ✓ Lichtspectrum: 365 nm: 130 mW/cm<sup>2</sup> of 405 nm: 300 mW/cm<sup>2</sup>
- ✓ Stralingsoppervlakte: 137 \* 75mm
- ✓ Spanning: 110-230V / 40-60Hz
- ✓ Vermogen: 64W
- ✓ Gewicht: 1.8KG

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## Application areas – Car (window) repair – part 2

### Technical Data



#### UV bescherm bril - zwart



Oogbescherming moet worden overwogen bij het werken met kortegolf-en mid-range en zelfs lange blootstelling aan lange golf UV licht bronnen, oogbescherming elimineert het risico. De transmissie UV is nihil.

#### UV bescherm bril - geel



Oogbescherming moet worden overwogen bij het werken met kortegolf-en mid-range en zelfs lange blootstelling aan lange golf UV licht bronnen, oogbescherming elimineert het risico. De transmissie UV is minimaal.

#### Siko Autoruiten Reparatiehars



De één componentige acrylaat-lijm wordt gebruikt als reparatiehars bij de reparatie van sterretjes in autoruiten. Het uitharden gebeurt door middel van UV-licht in het gebied van 250 tot 365 nm.

Kenmerk:

- ✓ Verpakking: flesje 50 gram
- ✓ Kleur: transparant
- ✓ Viscositeit bij 20°C: 90 mPas

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## Application areas – Car (window) repair – part 3

### Technical Data



#### Ruitenkit



De ruitenkit is een kit voor het afdichten en verlijmen van ruiten, 1-componentig, elastisch, (lucht) vocht-uitdardend op basis van MS-Polymeer. De belangrijkste toepassing is het verlijmen van ruiten. Ook geschikt voor het UV-bestendig afdichten van ruiten

#### Primer t.b.v. ruitenkit



De primer 760 is een 1-componentige zwarte primer voor extra UV bescherming van verlijmde glazen ruiten

#### Primerbol



Het verlijmen van autoruiten luistert zeer nauw en een optimale voorbehandeling is dan ook van het grootste belang.  
Gevaar bij veelvuldig gebruik van steeds dezelfde primerbol is dat u stoffen vanaf de ruit via de primerbol terug in de primer brengt waardoor de primer verontreinigd kan raken en daardoor aan betrouwbaarheid verliest.  
Daarom is ons advies, gebruik de primerbol met 1 dip in de primer, strijk zo ver mogelijk uit, en gebruik dan weer een nieuwe.

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## Application areas – Car (window) repair – part 4

### Technical Data



#### Siko S1600

#### Siko S6000

#### Siko S3000

#### Siko – Superglue & Tread Locker



CA 2400	Ultra thin	2-5	Fast
CA 2401	Thin	75-125	Medium
CA 2403	Medium	300-500	Medium
CA 2407	Thick	700-1000	Medium
CA 2412	Extra thick	1200-1500	Slow
ML 5243	Blue	1200-3000	10~15 min
ML 5371	Red	400-600	15 min

#### DP2 600-62-100



Pneumatisch dispenser 2x290ml voor het verwerk van oa.

- DOW BetaLink
- DOW BetaForce
- DOW BetaMate
- DOW BetaCore

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