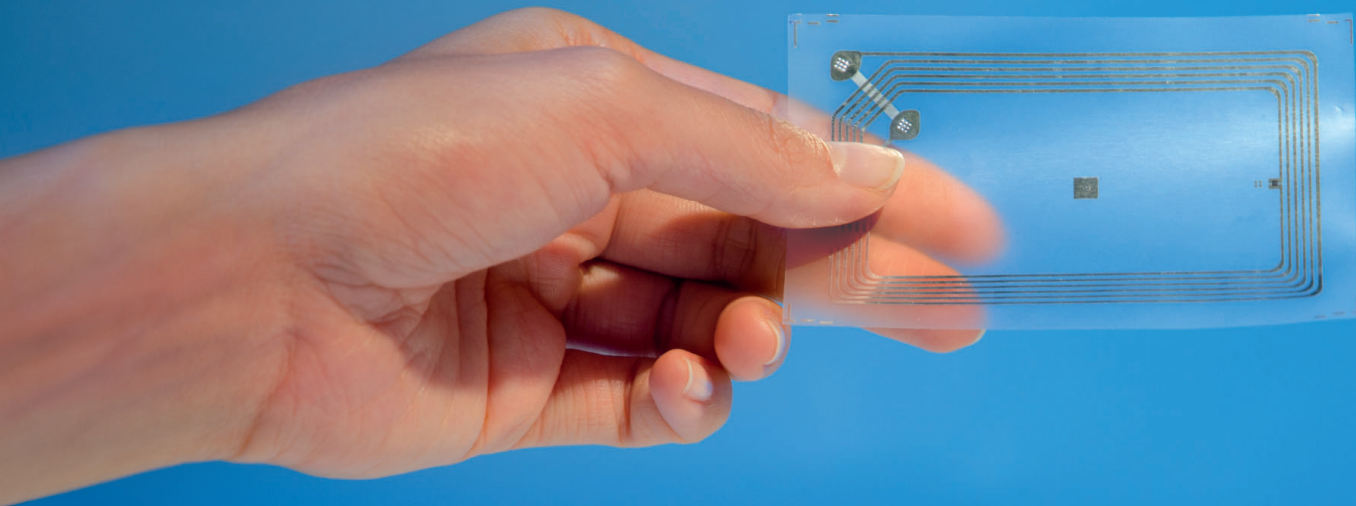




Smart label



Smart Bonds in RFID Technology



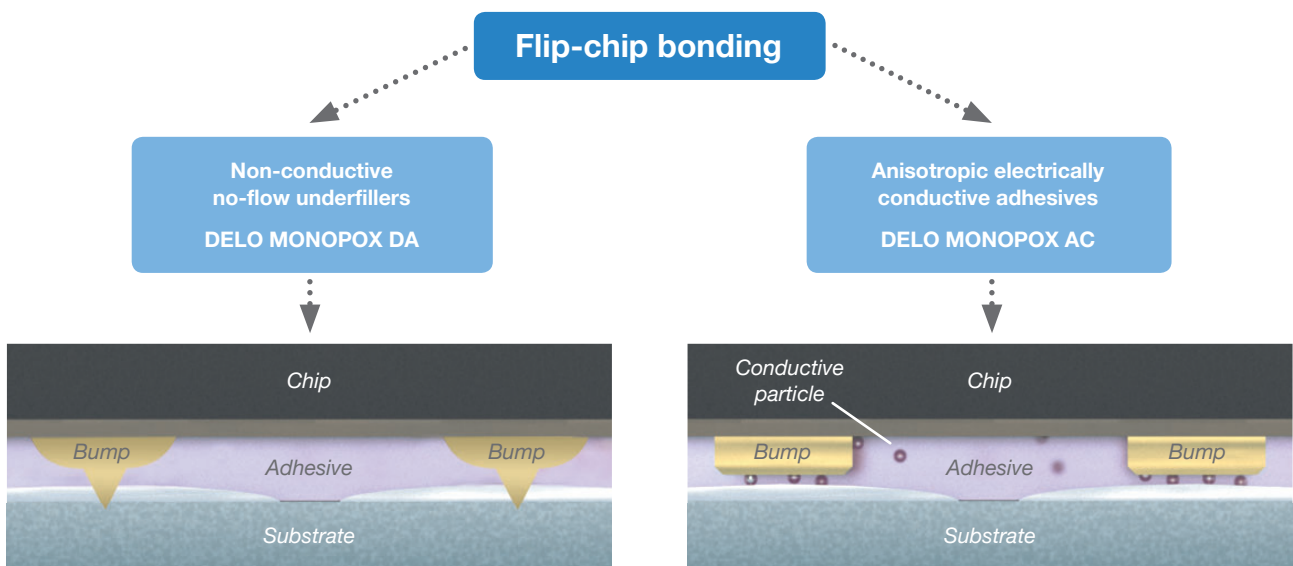
Ask the experts

DELO is the world leader in RFID adhesive solutions. Our adhesives can be found in two out of three RFID labels used in the world today. Customers rely on us as a partner who can understand and assist them during the entire process.

Regardless of the material or chip design, reliable connection of the chip to the antenna is essential for the function of any RFID transponder.

The correct adhesive and choice of process parameters can have a dramatic impact on the performance and reliability in your RFID application.

Our engineers have extensive experience that shortens development cycles and production scale up. They ensure that all factors are taken into consideration beginning in the design phase, and that the design is successfully transferred into production.



The schematic illustration above shows the structure of a flip-chip with stud bumps in combination with DELO MONOPOX DA.

DELO MONOPOX AC is typically used for flip-chips with flat bump designs. DELO adhesives provide reliable mechanical and electrical contact in one step.

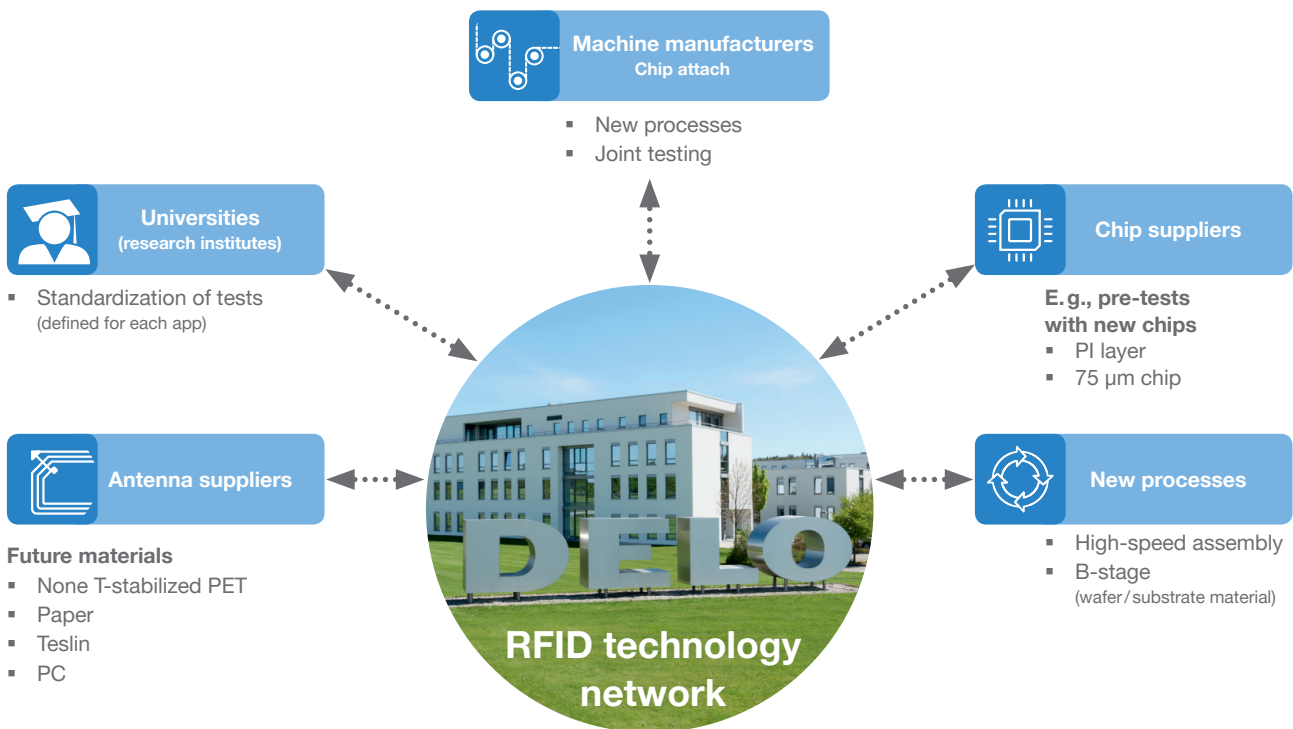


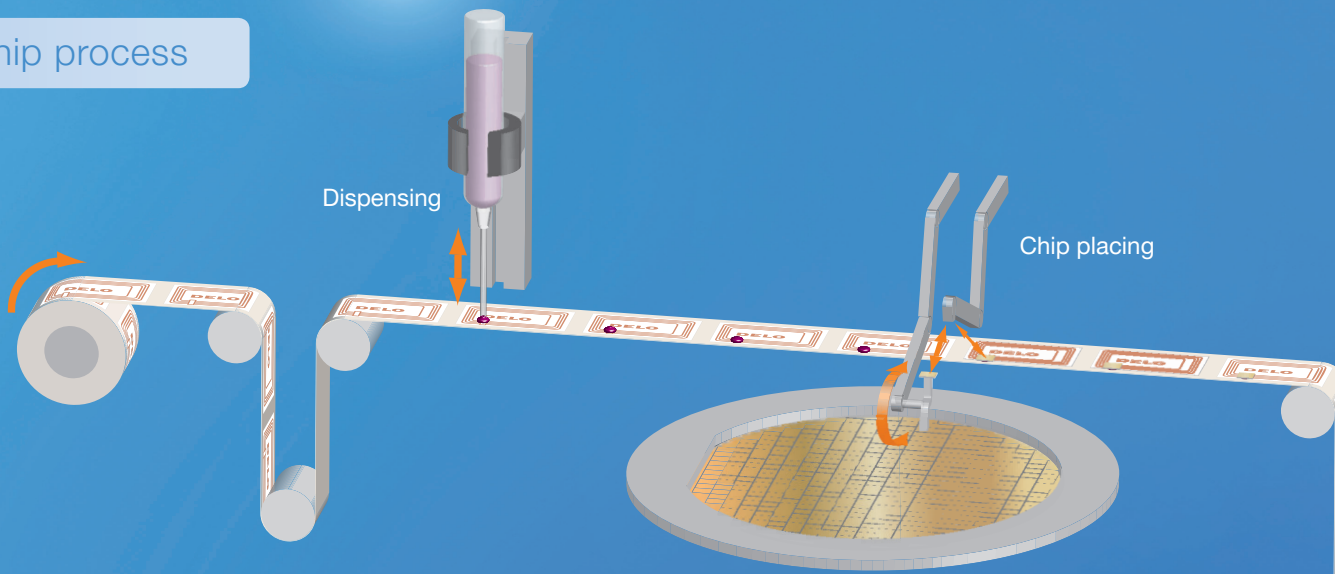
More than an adhesives manufacturer

We are an adhesives manufacturer, but we go a step further as a custom service provider – helping you making your processes more efficient and giving you an edge over your competition. Our strong and extensive network in this application field allows us to support you in your current and future challenges.

Every day new substrates, chip designs, and production processes enter the market. DELO's corporate structure is specifically designed to enable rapid development of custom solutions for your individual application. This ensures the fastest time-to-market, and allows you to capitalize on the competitive advantage of new designs.

Contact us for details!





We go with you every step of the way!

Analysis

Our adhesives are configured for HF, UHF, or LF tags, as well as for a great variety of substrates, chips, and placing machines. Customers can select from a wide range of standard adhesives, or if needed, we can modify them to meet specific requirements.

Designing and implementing an adhesive process for RFID production is a complex matter. Many parameters including chip type, substrate, pick & place equipment, adhesive, and in general the requirements for the final product need to be considered.

Having the right adhesive properties such as strength and humidity/temperature resistance is just not enough! The adhesive also needs to be precisely tuned to the specific production line process.

Lab expertise

We offer you all of our adhesive laboratory expertise. We will run all the tests necessary for the specific application, from dispensing to reliability testing.

Dispensing

- Pressure/time control
- Screen printing
- Jetting

Chip placing

- Manual placement
- Semi-automatic placement

Curing

- Thermode process
- Oven curing

Aging

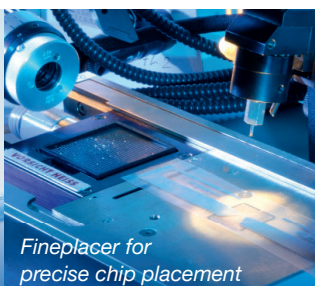
- Temperature humidity testing (+85 °C/85% r.h.)
- Temperature shock testing (-40 °C/+85 °C)
- Bending

Testing

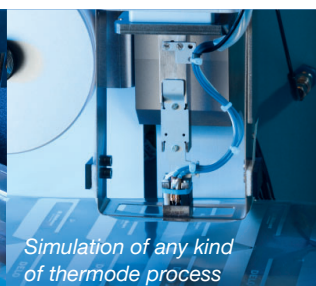
- Read range
- Q-value
- Die shear



DELO-DOT PN for jetting



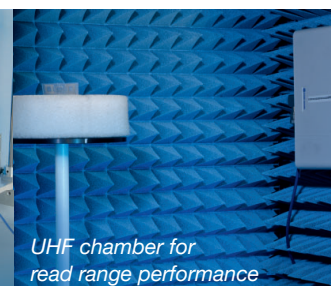
Fineplacer for precise chip placement



Simulation of any kind of thermode process



Bending tester for reliability testing

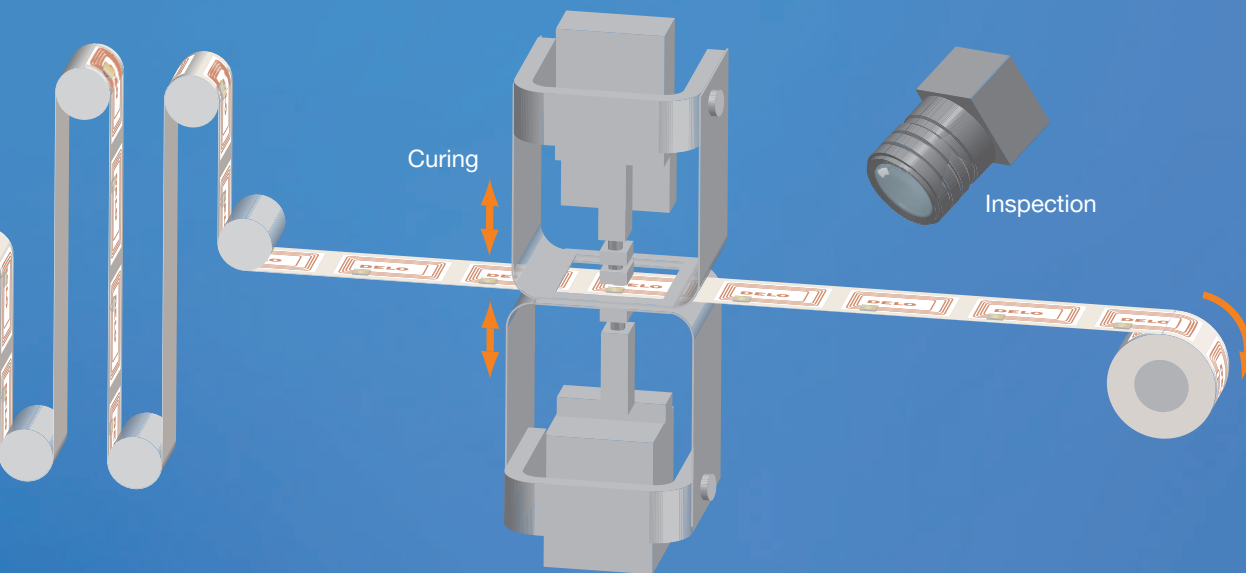


UHF chamber for read range performance

Analysis of the application profile



Lab expertise



Dispensing and curing

With our lab expertise we are able to advise you with parameters for dispensing and curing like:

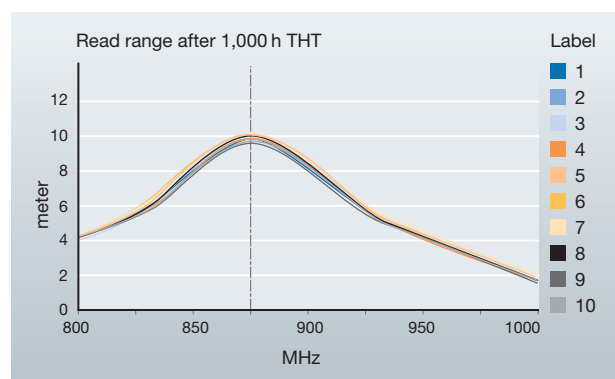
- Pressure
- Needle diameter
- Jetting parameters
- Curing temperature
- Curing time
- Bonding force



Reliability

Reliability testing is critical to the success of your product. DELO has the capabilities to help you understand exactly how your product will perform by simulating the life cycle of a RFID label through:

- Climatic storage (e.g., temperature humidity testing, temperature shock testing)
- Mechanical stress (e.g., bonding)
- Performance tests (e.g., read range, Q-value, ...)

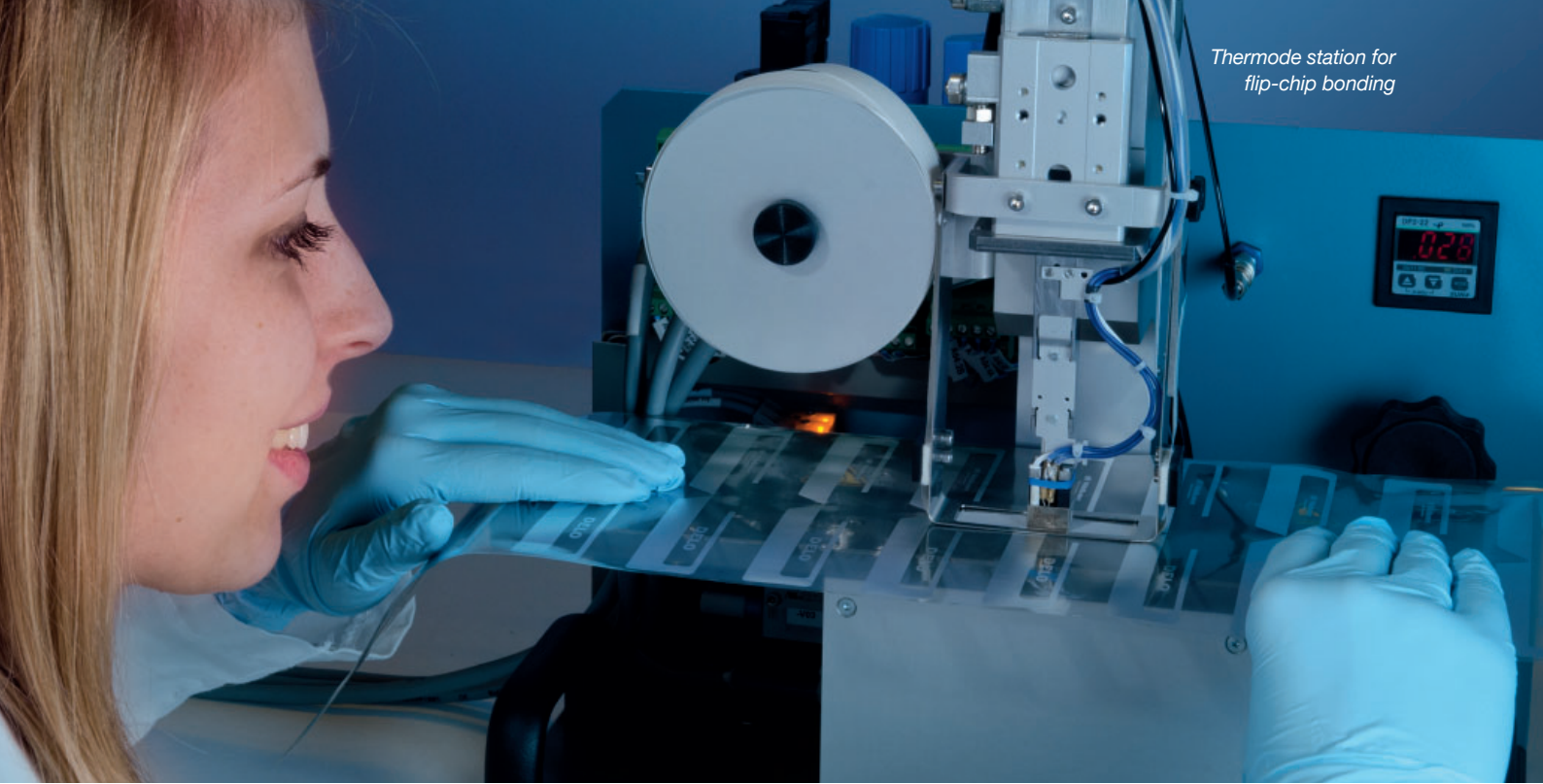


Dispensing and curing



Reliability





Thermode station for
flip-chip bonding

Commission

After detailed lab testing, we test the adhesive in the actual application at your facility. Our specially trained engineers work globally and go on-site to help you implement our products in your processes.

We

- Adjust the adhesive for the specific machines
- Conduct extensive tests on dispensing, placing and curing
- Assist you in your production ramp-up

Support

We provide ongoing personal support during the entire project:

- Selecting the adhesive
- Optimization for the substrates and materials used
- Laboratory and on-site testing
- Integration in the actual production process

Even after your process is up and running, we help with any challenges that may arise during production and assist you in constantly improving the process. With DELO, you can be sure that you will be supported every step of the way.









Ramp-up



Support through the entire process

Innovative product range

RFID Chip Attach Adhesives Material Selection Guide						
Product	Application	 Non-conductive adhesive (NCA)	 Anisotropic conductive adhesives (ACA)			
	Product group	DELO MONOPOX				
	Product code	DA255	AC245	AC265	AC268	
	Operational area	bank card, transport facilities, logistics, textile, automotive	transport facilities, logistics, textile, automotive, standard substrates			
	Reliability, output	high reliability high output suitable for jetting	highest reliability high output optimized for jetting	high reliability on aluminum increased reliability on copper	highest reliability high output	
General	Basis	epoxy	epoxy	epoxy	epoxy	
	Color	gray, opaque	gray, opaque	brown, opaque	black, opaque	
Properties, Curing	Viscosity [mPas]	33,000	33,000	26,000	32,000	
	Water absorption [%]	0.2	0.1	0.4	0.25	
	Curing temperature [°C]	min	+100	+100	+100	+90
		max	+210	+210	+210	+210
Heat curing with thermode	6 s @ +180 °C	8 s @ +180 °C 6 s @ +200 °C	8 s @ +180 °C 6 s @ +200 °C	8 s @ +170 °C 6 s @ +190 °C		
Mechanical values	Young's modulus [MPa] at +25 °C DMTA	3,200	3,900	3,700	3,700	
	Glass transition temp. T _g [°C] DMTA	+139	+149	+149	+138	
	Coefficient of linear expansion [ppm/K]	below T _g	58	55	60	60
above T _g		170	180	180	170	
Storage	Storage life	at room temp.	3 days	7 days	2 weeks	3 days
		at -18 °C	6 months	6 months	6 months	6 months
Delivery	Min. order quantity per delivery	1 PU (= 1 cartridge)	1 PU (= 1 cartridge)	1 PU (= 10 cartridges)	1 PU (= 1 cartridge)	
	Available container sizes	10 cc	5 cc, 10 cc	5 cc, 10 cc	5 cc	
	Halogen-free according to IEC 61249-2-21					

* specific sales product
PU = packing unit



CONTACT

DELO Industrial Adhesives
Headquarters

► **Germany** · Windach/Munich



- **China** · Shanghai
- **Japan** · Yokohama
- **Malaysia** · Kuala Lumpur
- **Singapore**
- **South Korea** · Seoul
- **Taiwan** · Taipei
- **Thailand** · Bangkok
- **USA** · Sudbury, MA

..... www.DELO-adhesives.com

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.

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ADHESIVES

DISPENSING

CURING

CONSULTING

DELO