





PART I

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1. Leading through intelligent bonding technology

1.1. Specialist for turnkey solutions

DELO has more than 50 years of experience in industrial adhesives. A team of specialists is working on fast and process-reliable solutions for adhesive users in high-tech industries. Our key goal is to strengthen our customers' innovative energy, accelerate processes, and enable cost savings. Our internal structures provide us with the flexibility to meet individual customer requirements even at short notice. In order to achieve optimum bonding processes, various components must be harmonized with each other – from pretreatment methods to adhesives, dispensing units, and curing lamps right through to their implementation in the process. As a service provider, we assist our customers by integrating our experience with manifold, specialized applications and putting our expertise at their disposal. For many years,

we have been investing our extensive knowledge of bonding technology in the development of devices for industrial production processes.

Whether in microelectronics, consumer electronics, or in the automotive sector, high-tech adhesives have to meet the highest requirements. Every single raw material, not only the final product, is thoroughly tested. We are privileged to work with other technology leaders who contribute modern system technology to our projects.

1.2. Partner for innovations

Our thorough understanding of technologies and the challenges adhesive users face, combined with sound professional support, creates the basis for a cooperative partnership. We support our customers' innovations through intelligent adhesive solutions and a targeted exchange of knowledge, thus ensuring the successful use of our adhesives from conception to implementation in production.



1.3. Research and development

Every year we invest 15 % of our revenues in research and development, compared to the industry average of 3 to 4 %. We earn almost 35 % of our revenues from products that are less than three years old. We are the global market leader with our light-activated and UV-curing DELO KATIOBOND adhesives, the light-curing DELO PHOTOBOND products, and our dual-curing products based on different reaction mechanisms. Our modern laboratories provide ideal conditions for the development of unique products in line with market requirements.

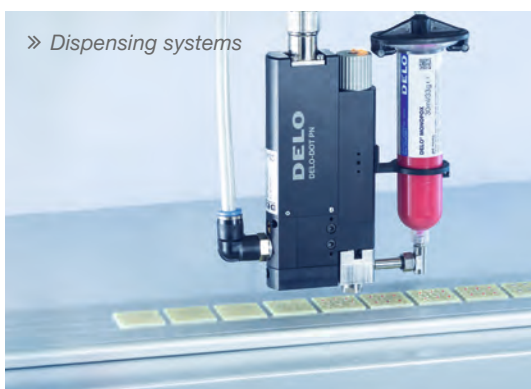
1.4. Broad product range

DELO's portfolio includes adhesives based on various chemistries – from acrylates, epoxy resins, methacrylates, and polyurethanes to cyanoacrylates, silicones, and patented special chemistries. To meet our customers' high demands, we have specialized in light-curing, light-activated as well as heat-curing and

» Adhesives



» Dispensing systems



» LED curing lamps



» Training courses and seminars



» DELO Industrial Adhesives in Windach,
45 km west of Munich



dual-curing adhesives. Numerous curing mechanisms enable optimized and customer-specific process design. The production facilities at our Windach headquarters exceed the technical challenges and high quality requirements of adhesive production.

1.5. Highest quality

DELO is certified according to ISO 9001:2015. We are committed to target-oriented development, detailed introductory tests, professional consulting, continuous monitoring, maximum reliability, and consistent enhancement of our high-tech products. DELO has also obtained the ISO 14001:2015 certification as a proof of responsible environmental management.

1.6. Technical consulting and support

Technical sales engineers give on-site advice and are pleased to support adhesive users in implementing optimal production processes. The Engineering Department provides product support with extensive tests using practice-oriented process equipment. The Engineering laboratory team bonds original components, determines technical adhesive values, and conducts further characterizing tests. The results and analyses are made available to our customers and help them select the right product and the most appropriate production process. Our sales engineers also work closely with Product Management and R&D to develop tailor-made customer solutions. In the interest of our customers, we maintain close relationships with machine integrators and material suppliers.

1.7. Qualified staff members

All our new employees will receive up to three months of basic and mission-specific intensive training with theoretical and practical elements. Thoroughly trained and experienced engineers prepare diversified and exciting courses with many use-case examples. These courses are followed by individual training in the employee's specific department. Every colleague is supported by a tutor and a mentor, so that they soon feel at home at DELO and can take on responsibility.

1.8. Cooperation with users

Solving bonding tasks is demanding and requires close cooperation between user and adhesive manufacturer

[> fig. right]. Therefore, early contact between user and adhesive specialist is very useful for simplifying this process and finding a systematic approach. The time available during an early project phase can be used efficiently for adhesive selection, process design, system testing, functional verification, and for training of employees.

1.9. Knowledge transfer through the DELO Academy

A high level of experience and knowledge is required for successfully performing bonding tasks. The DELO Academy offers a wide range of training courses, seminars, and subject-specific webinars. The program ranges from basic to project-related training courses, addressing adhesive users, interested parties, as well as beginners and re-starters in the field of bonding technology.

Project-related training courses on special topics

For questions arising from experience with bonding technology and from ongoing or planned working processes, DELO offers training courses and workshops specifically tailored to the user's projects and level of knowledge. In these courses, the tasks are analyzed, tests are conducted in the laboratory, and sustainable solutions are developed.

Project-related, on-site training courses

On-site training courses or seminars are suitable for subjects in bonding technology that are best discussed on the customer's premises, for example, topics specific to their production areas.

These services help ensure that:

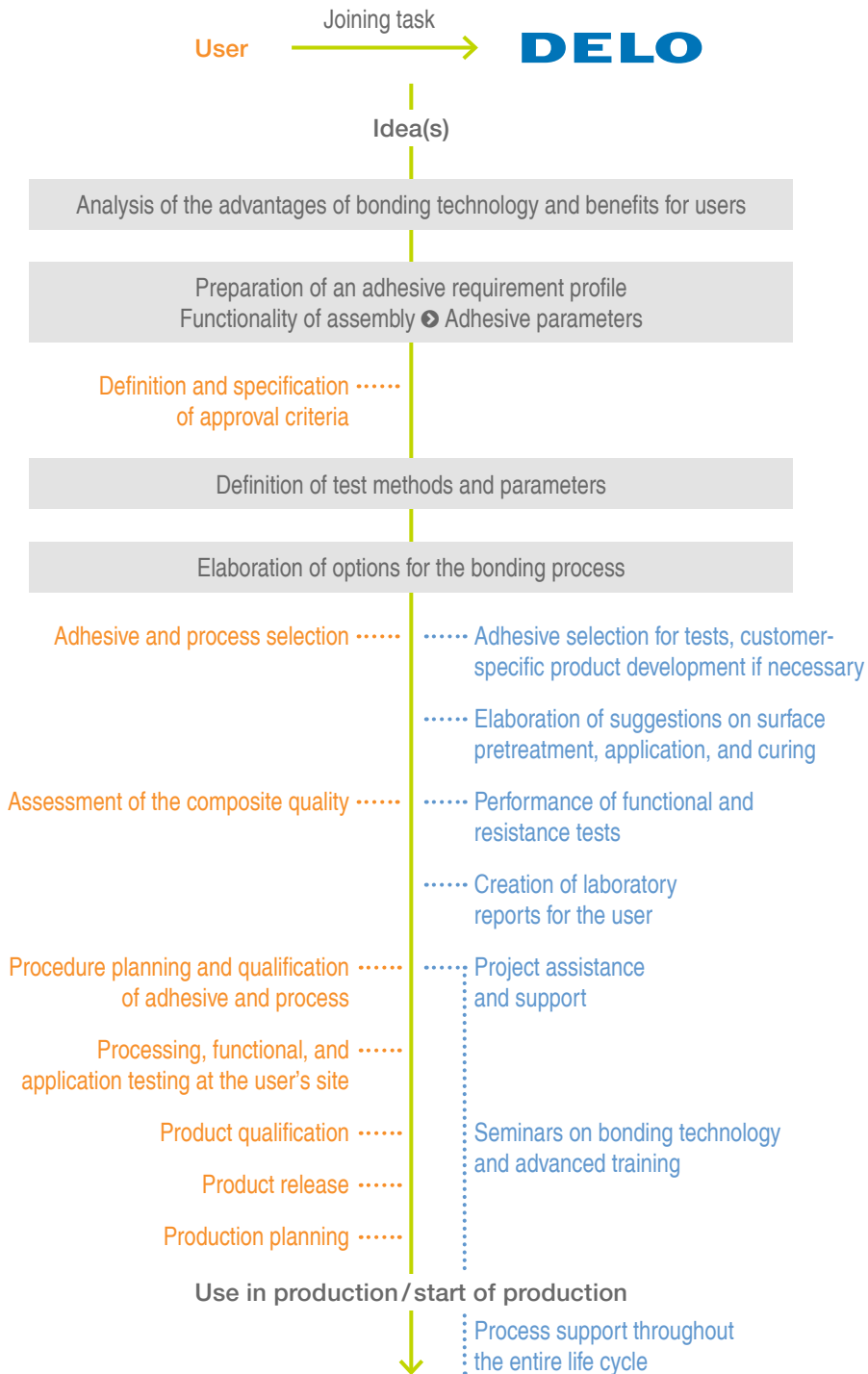
- adhesives and production technology are aligned with each other,
- project and development times are reduced,
- the products and technologies used are state-of-the-art,
- and a mutually beneficial, long-term cooperation is established and maintained.

Webinars and seminars

Webinars provide participants with a first insight into the basics of bonding technology, specific adhesives, areas of application, or a topic specific to



Project work with DELO – from concept to the final product





their needs. DELO offers webinars on various topics several times a year. The basic and topic-specific seminars provided by the DELO Academy not only focus on imparting theoretical knowledge, but also and above all on practical experience. The seminars take place at DELO but can also be held on site at the user's premises.

Cooperation with educational institutions

The DELO Academy works closely with schools, colleges, and universities. For example, for several years now, we have been running joint courses with Munich Technical University and Nuremberg Technical University in order to introduce future engineers to the possibilities of bonding technology and to provide a practice-oriented approach.

Vocational education and training of DELO staff

We attach great importance to the vocational education and training of our own employees. Especially in complex bonding technology, having well-trained and skilled staff is crucial for comprehensive and customer-oriented advice and long-term corporate success. Depending on the department and position, new employees undergo a thorough training program. The DELO Academy also supports in-service training with an extensive range of advanced training courses including technical training and the opportunity to acquire specific additional qualifications.

1.10. Satisfied customers

Being listed in an independent study labeled "Germany's Customer Champions" confirms that we have extremely satisfied customers. DELO has also been awarded several supplier prizes.

Our customers include

- Bosch
- BSH Hausgeräte
- Continental
- Daimler
- Diehl AKO Foundation
- ebm-papst
- Festo

- Foxconn
- German Aerospace Center (DLR)
- HANA Microelectronics
- Honeywell
- Huawei
- Infineon Technologies
- Miele
- OSRAM
- Recaro Aircraft Seating
- Siemens
- Sony
- STIHL
- ZF Electronics



2. Possibilities of bonding technology

Bonding technology is a very efficient joining method used in all manufacturing industries with great and ever-increasing success.

The number of modern materials, especially high-performance plastics, continues to increase enormously and requires suitable, material-friendly, and reliable joining techniques. Intensive development efforts ensure that adhesives and processes are becoming increasingly efficient. Bonding technology creates connections that enable mobility and

communication, ensure safety, address health and environmental aspects, and improve aesthetics and quality of life. As a matter of fact, in many areas, it is only bonding technology that enables technological progress and innovation.

In Germany alone, almost one million tons of adhesive are produced annually for the broad variety of bonding tasks, and the trend is rising (source: Federal Statistical Office, Statistical Yearbook 2019).

Particularly in the industrial arena, adhesives have become an essential design element and fulfil a variety of functions. No other joining method can deliver comparable results. The multitude of successful



» The focus is on consulting and development



applications in many different areas is clear evidence of the special advantages and opportunities of bonding technology. There are five major reasons why the joining technology of bonding will continue to expand its key position in the industry:

2.1. Diversity

Adhesives can be used to join many different materials in any combination, especially those that cannot be welded, and create material-compatible, low-stress, and durable bonds. The material properties of the components are generally retained.

2.2. Miniaturization

Bonding technology provides the basis for miniaturization, which is rapidly advancing in all areas. Whether in the field of communication, in the smart card industry or in the automotive industry: adhesives meet the highest requirements in the most confined spaces. Their use can significantly reduce weight, and therefore, energy demands.

2.3. Speed

Adhesives are also used if components need to be fixed and positioned quickly. In series production lines



with high production volumes, they allow for extremely short cycle times, and thus, cost-efficient production. This plays a decisive role, especially in the production of microchips, mini speakers for smartphones, and many electronic components.

2.4. Design

In all fields, adhesives provide an infinite multitude of creative design opportunities. In the design of glass, plastic, or furniture, for example, adhesives offer the obvious advantage of being an invisible connection, preserving optical or visual properties and perfectly

satisfying the requirements of aesthetics, design, and function.

2.5. Functionality

Cured adhesives are functional materials that are also used for insulation, electrically conductive contacting, and heat dissipation. They can also serve as optical lenses or transfer acoustic vibrations in a targeted way. These properties open up application areas involving interesting innovation potentials in modern high-tech markets. Bonding is a complex production method that offers almost unlimited possibilities for technological progress.



Intelligent turnkey solutions from DELO provide for innovation and efficiency.

» Research and Development
Laboratory, DELO / Windach
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