

The entire Group is benefiting from the innovative development and production solutions of the Turck subsidiary duotec



Tailor-Made Solutions

Turck duotec develops and manufactures customized solutions for challenging electronics applications

How do you process membrane chips with a wafer-thin membrane only 2 μm thick in large quantities without ruining them? And what is better suited – the printed circuit board or hybrid technology – for designing a sensor for a passenger car braking system that is subject to considerable accelerations and temperatures?

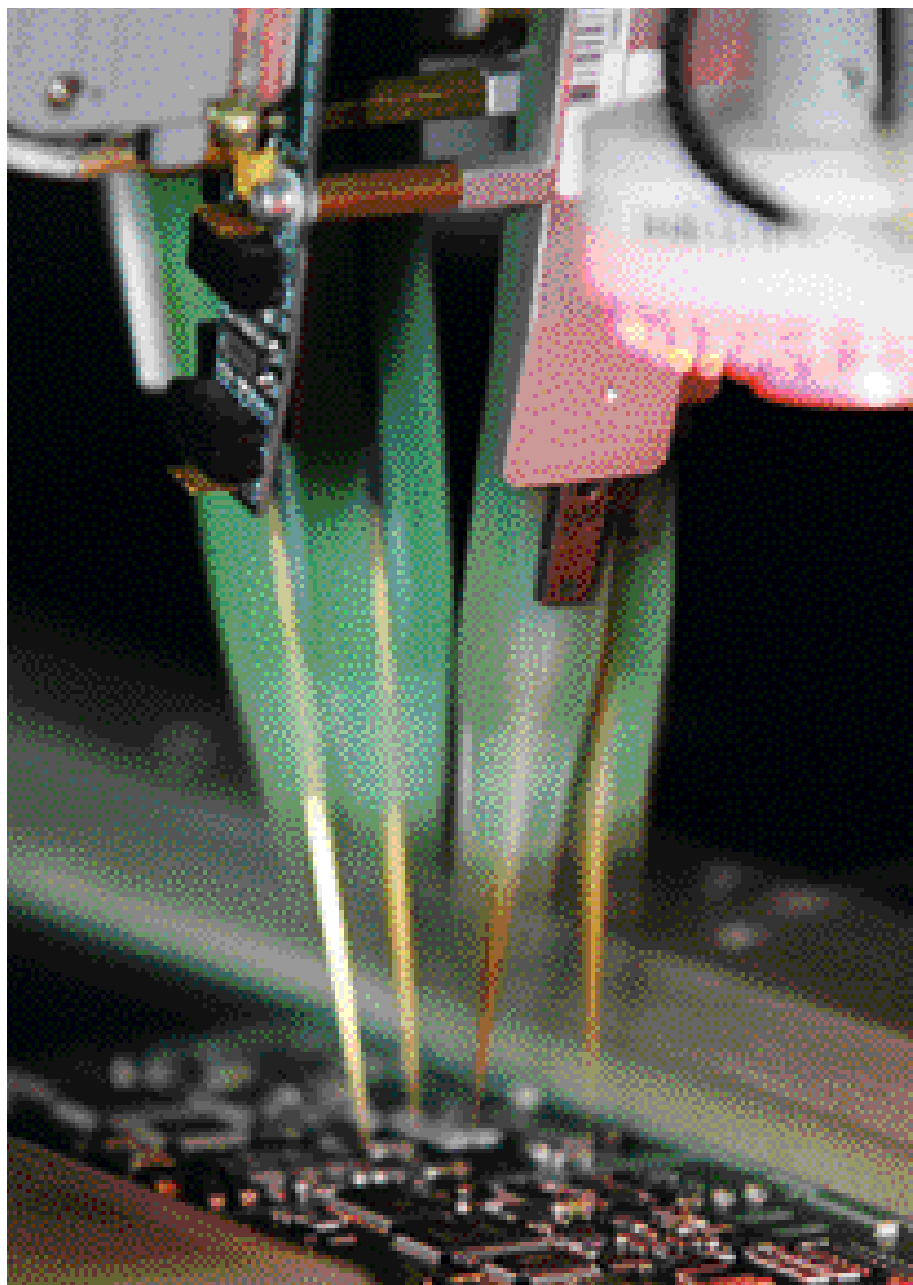
These are questions that the specialists from Turck duotec GmbH have been grappling with. “Our business is all about technologies that challenge us,” says Dr. Ralf Behrensmeier, technical director of the Turck subsidiary, who adds: “Our strength is clever solutions for special applications.”

The company specializes in customized development, production and design work in the field of electronics and has three locations: Halver (North Rhine-Westphalia), Grünhain-Beierfeld (Saxony) and Delémont in Switzerland.

It all started with hybrids

The success story of Turck duotec began in 1987. “We needed hybrids for our miniature switch production,” recalls CEO Werner Turck. “But hybrids were difficult to come by at that time. That’s why we decided to begin producing them ourselves.”

In order to produce them cost effectively, Turck decided to produce products for other companies as well as their own. At that time, the demand for them was so high that Turck duotec was able to sell the hybrids to other companies, even with complete placement, if requested. “Because we had introduced SMD placement in our factories in the early 80’s, we were also able to offer this service to our customers,” explains Werner Turck. “So we had the big advantage of being able to offer our customers both technologies – the hybrid as well as SMD circuit boards.” This emphasis on dual technology helped



determine the name of the new company: duotec became the new Turck subsidiary, and functioned as a pure sales organization for the hybrid and SMD technology. The production side of the operation still belonged to the parent company. Werner Turck explains: “We couldn't establish a sales office for this new service the same way we had done so for our classic “yellow” Turck products in Mülheim. In order to acquire customers for the new products, the sales office had to be close to where the technology was produced. That's why we established duotec at the Turck production and development plant in Halver.”

Initially, there was only one man who represented duotec, Dr. Kurt Elsässer, who was a physicist and well versed in the field of hybrid technologies. He was able to get “into the technology” in detail with customers. A philosophy that has remained to this day. Even Dr. Ralf Behrensmeier, who took over technical man-

agement from Elsässer in 2002, has an advanced degree in physics. “This highly technical qualification, which is embodied in duotec, is not only useful for our customers, but also for us at Turck,” underlines Werner Turck, “because our experts have to work together with customers in detail on the production

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Founded exactly 20 years ago as the sales organization for hybrids, Turck duotec has, in the meantime, become a specialist for challenging electronics applications in the most varying of industries. The Turck subsidiary functions on the market as a competent partner for customized development, production and design projects. To carry out such projects, development and production capacities of the Turck Group are skillfully utilized, which, for its part, again benefits from large production quantities and innovative production solutions.



Twenty years ago, Werner Turck founded duotec to meet a need, now it has become a lucrative company

engineering for electronic components. Our experience acquired from this work has also benefited us in the way we produce our classic products. Moreover, duotec has enabled us to dramatically increase our production volumes and the number of mounted components. Nowadays, in Halver, we are producing far more than 50 percent of our total of 350 million components per year for duotec. This means that we can naturally also attain better prices in the purchase of components for Turck products."

Strength lies in the technology mix

"Through our high vertical range of manufacturing, we can offer various production options on the market," says Johannes Schaefer, commercial director at duotec. "For complex applications that require several of these production options, we can offer our customers hybrid, SMD or a combination of both for the greatest value." Behrensmeier emphasizes: "The technology mix that we are offering is a true unique selling point compared to many competitors. Additionally, we are not limited to certain



Johannes Schaefer, commercial director, promises the market "innovative solutions"

industries or products, rather we can offer solutions for the most varying of applications. We offer special separate solutions that you don't have to purchase straight from the rack."

Behrensmeier mentions, as an example, a chip that has a large number of connections, so-called wire bonding, that have to be mounted on to the printed circuit board. "Due to the high number of contacts, the limits of feasibility were exhausted when it came to structuring the printed circuit board, but also in terms of our production machines. This is the kind of project that is typical of the work we do. Together with our customers, we work out solutions that implement the customers' applications on the production side – even if we have to go to the very limits of what is possible to do so."

This requires close proximity to the customer which Behrensmeier sees as one of duotec's other strengths: "In order to find qualified solutions, close cooperation with the customer's development team is absolutely critical, this is something that competitors from Asia, for example, simply cannot offer."

 A large, complex industrial electronic assembly, possibly a power supply or control unit, with many components and a metal casing.

With individual electronics solutions for customers from the most varying industries, Turck duotec is holding its ground on the market

Example: intelligent oil dipstick

Duotec engineers even take on complete electronic development for their customers. One current example of this is the seemingly simple oil dipstick for a well-known U.S. motorcycle brand. It is made by a German specialist for tuning and supplier parts for the automobile industry. The oil dipstick is not only supposed to display the oil level, but also the oil temperature. "The customer is a mechanical solutions specialist and has many highly innovative product ideas," explains Johannes Schaefer. "This customer had us develop the electronics that are often necessary to implement its ideas. It is a fantastic partnership where collaboration begins right at the concept phase." What resulted is an "intelligent" oil dipstick that not only displays the oil temperature at the press of a button, but also measures the exact oil level using an ultrasound sensor. The electronic measurement of the oil level was a challenge because the oil can reach temperatures of up to 150 °C; when the engine is running, foam develops that floats on top of the oil. Air bubbles and metal particles in the oil cause additional difficulties that duotec developers have all but eliminated.

"We were able to draw on unlimited resources to come up with the solution. For example, it incorporates thick film technology, adhesive technology, soldering technology and safety engineering, as well as our experience in the sensor field and in bond-

Made by duotec: LCD gear display



Turck duotec has had a decisive impact on the development of the INDY-CATOR, an innovation created by Gaslock, a passenger car parts developer from Iserlohn, Germany. This product is a digital gear display that is easily mounted on the gear-shift lever as a knob. The INDY-CATOR is a design object and display element in one, with a precise and easily readable gear display. Simply using the position of the gear knob, which is identified by the sensors, the system recognizes the gear currently engaged. Only a teach-in procedure during installation is necessary to achieve this. Thus, regardless of car brand, the INDY-CATOR is compatible with almost any gearbox systems up to 6 gears. Additional information: www.indy-cator.de



Dr. Ralf Behrensmeier: "The technology mix that we are offering is a true unique selling point."

ing technology. And the good thing about it is that this package of applied technology has made the dipstick so simple," raves Behrensmeier. Duotec was able to file the corresponding patents for this solution with high force of innovation. "Currently, there is no electronic method for checking oil like the one we have developed for this oil dipstick," says Johannes Schäfer. "Even with large engines, only mechanical processes are applied that are relatively inaccurate. The need to achieve a modern electronic solution for this is therefore quite large. Many automobile manufacturers who, in the meantime, have discovered our patent are already contacting us with inquiries."

Yet Schaefer also has markets in mind other than just the automobile industry. Though the automotive industry with its volume and sales shares of about 50 percent is currently duotec's most important market, duotec also has products that can be found in industrial applications or in high-tech toys. Schaefer's newest idea is a solution for the furniture industry. "We are getting involved in the LED technology market. LEDs are being used more and more in the furniture industry – as the most recent furniture trade show has indicated. We are able to offer innovative solutions with our approach in this industry as well. For example, the heat loss that inevitably occurs can be elegantly diverted using ceramic substrates – a material that we are well versed in thanks to our hybrid know-how. Moreover, we are able to build more than just lights, but intelligent systems that monitor themselves." The fact that duotec's LED elements don't require any ballast elements saves space and makes furniture look elegant.

Whether for furniture lighting, braking sensors or applications that have not been invented yet, many exciting solutions are still to come from duotec's creative development teams.

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