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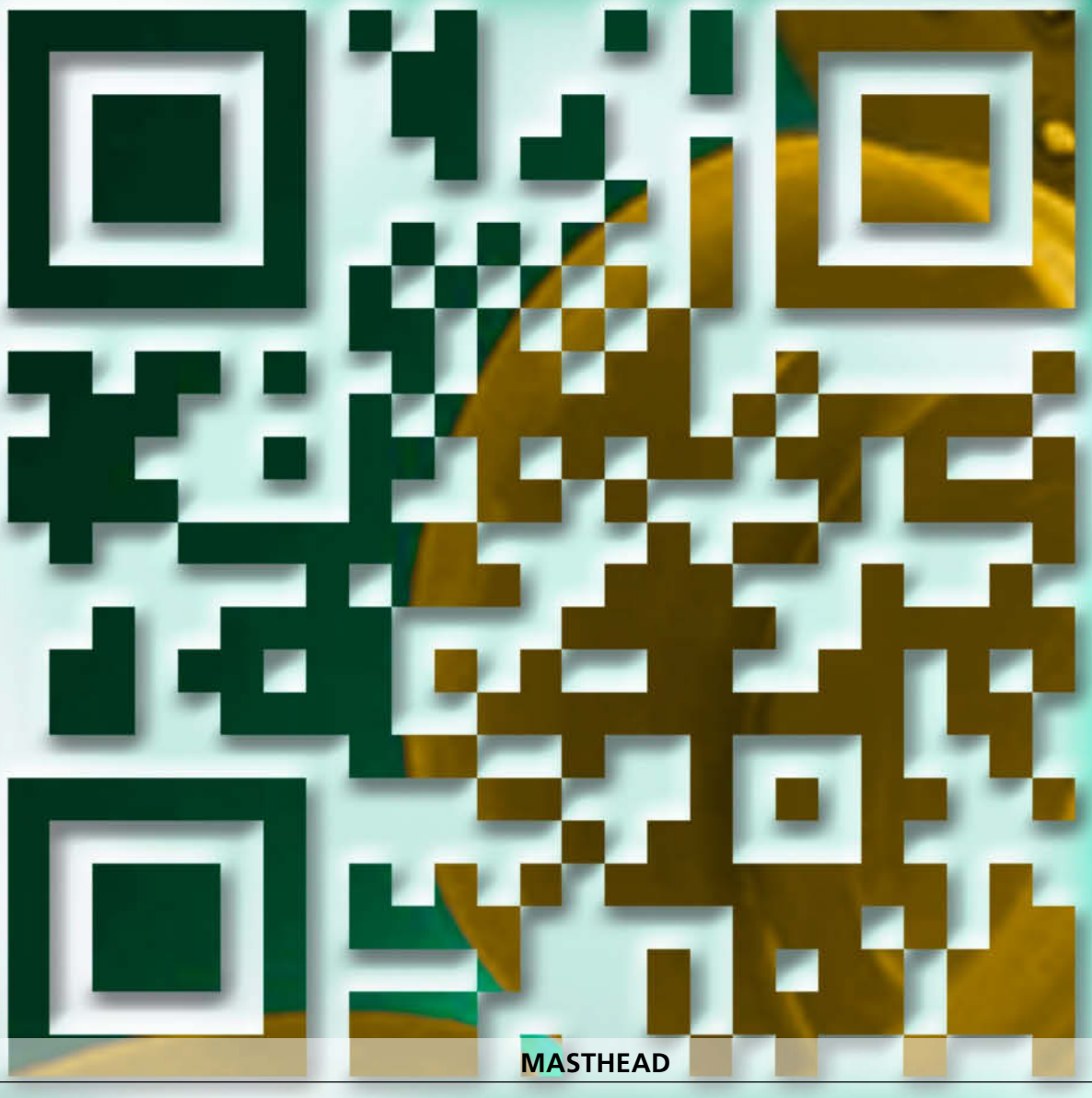

CONTENS

Customer report 2E mechatronic: MID specialist with huge potential for innovation

MASTHEAD

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Networking brings progress

2E mechatronic: MID specialist with huge potential for innovation

Cooperation brings results. This is the principle followed by 2E mechatronic GmbH & Co. KG with great success. Innovative products are continuously being developed and brought to production readiness in the context of networks and through cooperation with strong partners. Thanks to their R&D activities, the company, which is a member of the Narr Group, has developed into a high-end producer of mechatronic components and systems.

At present, 2E mechatronic has six research projects under way. Managing partner Uwe Remer explains how a company can cope with this volume of work with a total of 70 employees. "It simply isn't possible for us, as a medium-sized company, to do all this ourselves - nor would it make sense. That's why we've been active in numerous expert networks for over ten years, cooperating with various institutes and universities, as well as well-known companies such as Bosch, Delphi, Festo, Hella, KaVo Dental, Leica Geosystems and Rafi. We've been so successful in developing our own products together with pilot customers that we're planning to expand this area in the future."

2E has already been successfully involved in a number of research projects in the area of microsystems technology since 2001. "The fact that 2E is now one of the world's leading providers of MID modules is the result of our network-based cooperative ventures," explains Uwe Remer. He points to benefits such as the bundling of expertise and easy communication with familiar partners, identifying mutual success as the overriding objective.

Laser direct structuring offers decisive benefits

The most frequently used MID production process is laser direct structuring (LDS). The basis for this is provided by precision moulded parts made from a laser-activatable substrate. The circuit layout is "inscribed" on the moulded part by means of a laser, whereby an additive compounded into the plastic is activated. The circuits are then built up through metallisation. The LDS process offers crucial benefits, such as miniaturisation through 3D capability and fine circuit structures, fast and flexible layout changes and machining of the LDS material in order to produce samples.

One example of this is the development of MID LED lighting elements in which 2E has brought together two pioneering

Photos: 2E mechatronic

Uwe Remer (top right) relies on expert networks. A successful example is the MID LED lighting element (above and below) for dental technology (photo on page 2).

technologies in a single product. Together with KaVo Dental GmbH in Warthausen, the first of these new lighting elements was developed in just six months, reaching mass production in January 2010.

MID LED lighting elements are in demand throughout the world

The numerous advantages of the MID LED lighting element have attracted a great deal of worldwide interest from the medical, automotive, industrial electronics and automation sectors. These advantages include low energy consumption, longer service life, customised colour spectrum design, optimum light focusing thanks to the integral lens, higher luminescence, ease of replacement, good reliability and miniaturisation.

At present, production takes place on existing facilities. The first step involves producing the precision-moulded parts made from the laser-activatable plastic Vectra E840i LDS on a hydraulic ALLROUNDER 220 S, which operates with a 15 mm screw. The bases are then lasered and metallised in order to produce the circuit structure. Resistors and LEDs are inserted by means of an SMD machine and are subsequently soldered in a lead-free process during the vapour phase. The last production step involves the assembly of the base, lens and housing, followed by a functional check.

"We also intend to automate the production of the MID LED lighting elements as soon as we reach the appropriate unit volumes," explains Uwe Remer.

High-volume production of yaw sensor housings for ESP® systems has been ongoing since 2005. 2E produces the housing for Bosch, which processes it further and then supplies it to numerous motor vehicle manufacturers throughout the world. Several million of these precision housings were produced in 2010. As these are safety-related components, a zero-error strategy is pursued. "We're one of the few manufacturers who are able to guarantee the very high precision and reliability required throughout the product life cycle," says Uwe Remer with a smile, referring to the performance of his company and the high level of trust shown by Bosch.

The housings are manufactured fully automatically, with four production cells running in three shifts. The production sequence can be broken down into the following stages: The contacts, which are supplied on conveyor belts, are bent, separated and stamped out,

Large-volume series production of complex yaw sensor housings for ESP® systems (below) is highly automated (above).

before being inserted into the two-cavity mould together with the metal bushes and encapsulated with PBT. Next, a robot removes the finished housing and places it in an inspection station. The parts that pass inspection are automatically placed in the transport packaging, while the rejected parts are removed.

These systems were designed in conjunction with a local special machine manufacturer. "The vertical ALLROUNDER T 1200 with three-station rotary table proved to be the most suitable injection moulding machine for these products," comments Uwe Remer, who chose ARBURG for his company's injection moulding processes right from the start.

The right solution for every requirement

In addition to the extensive range of vertical machines from ARBURG that meet all of 2E's requirements, he also values the reliability of the machines and the service offerings. "Because we run a three-shift operation, machine reliability is crucial for us. This is particularly true when we need to run a machine seven days per week for several months, as happened in 2010."

INFOBOX

Founded: 1982 Rolf Hiller GmbH, renamed 2E mechatronic GmbH & Co. KG in 2002
Production area: 3,000 m²
Employees: approx. 70
Turnover: 10 million euros (2010)
Machine fleet: Nine ALLROUNDERs covering a clamping force range from 150 to 800 kN, including vertical machines with work-piece circulation systems and rotary table machines with three stations
Certification: DIN ISO/TS 16949, ISO 9001 and ISO 14001
Products: MID products, sensors, housing, connectors
Industries: Automotive (main focus), industrial electronics, medical technology, automation, renewable energies
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