

Healthcare industry BW

Innovative microsystems – injection-moulded and printed

Up-to-date injection moulding and printing methods can now be used to produce microtechnical components and entire functional units inexpensively and with the highest possible precision. Refined processing, coating and manufacturing techniques can make the serial production of microsystems considerably easier. Moreover, microsensors are increasingly being used as multifunctional units in the automotive, laboratory, medical and automation technologies. These are the conclusions reached at the second MicroMountains Innovation Forum for Microtechnology recently held in Villingen-Schwenningen.



Dr. Rupert Kubon (Lord Mayor of Villingen-Schwenningen), Thomas Albiez (Managing Director IHK Schwarzwald-Baar-Heuberg), Dr. Thomas Link (Chairman MicroMountains Applications AG), Claus Mayer (Baden-Württemberg Ministry of Economics).

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Numerous microtechnology innovations are currently entering the market where they are waiting to be discovered by interested companies that are able to appreciate and make good use of their potential. This was the key message at the recent MicroMountains Innovation Forum in Villingen-Schwenningen. Selected experts from science and research-oriented companies presented around 80 innovative developments from the field of microsystems technology in compact form. More than 100 decision-makers from industry took the opportunity to meet researchers and discuss the potential application of the innovations.

Uwe Remer, Managing Director of Wernau-based **2E mechatronic**, used his keynote lecture to demonstrate that research institutes and small- and medium-sized companies are able to come up with new products quickly and efficiently. In cooperation with the Hahn Schickard Society, Remer's company has developed inexpensive, universally applicable, miniaturised inclination sensors along with a number of other products. This enables the automotive supplier to attract new clients in different markets and to expand further.

Numerous presentations highlighted the potential of microinjection moulding. This process enables the generation of tiny structures with tolerances of less than one per cent. Two-component injection moulding of plastics, metal and ceramics powders in the micrometer scale is also ready for application and can be used to create robust surfaces.

The **Furtwangen University of Applied Sciences** presented a method for treating the surface of silicon structures - 3D electro polishing. This method enables the roughness of a silicon surface to be reduced to 10 to 15 nanometers, thereby making the structures suitable for use as injection moulds for micro-optical precision lenses or fluidic components.

Innovative sensor technology and production methods for medical technology and other industrial applications



MicroMountains Microtechnology Innovation Forum 2010
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The forum also focused on printing methods. For example, the **Institute for Micro Assembly Technology of the Hahn Schickard Society (HSG-IMAT)** presented miniaturised sensor structures made of fluid crystals that can be printed onto thermoplastic substrates using aerosol jet technology. This enables the production of low-cost temperature sensors that are less than one square millimetre in size.

The **Institute for Microsystems Engineering at the University of Freiburg (IMTEK)** showed how complex lithography processes for the production of masks can be replaced by printing methods enabling the creation of structures eight millimetres high and with a detail size of 50 micrometres.

Weinstadt-based **DeSta** presented a new industry-standard method that enables the excision of the smallest parts from any material using an extremely thin water jet. The water jet can be positioned with a precision of 0.0025 millimetres, something that has been virtually impossible to do until now. This water jet can be used in the same way as laser beams, but the advantage is that it does not heat up during the cutting process.

The new high-tech company **3D-Labs GmbH** based in St. Georgen presented a groundbreaking rapid prototyping method that can be used for the production of microtechnical device models and internal flexible parts with a wall thickness of 0.2 millimetres in a high-speed process. Ultra-low power is an issue that is being worked on by the Institute for Micro- and Information Technology of the Hahn Schickard Society (**HSG-IMIT**) based in Villingen-Schwenningen, which is planning to

develop microsensors for a broad range of applications that require very little energy or that can execute their functions more or less self-sufficiently.

The **Microtechnology Innovation Forum** is jointly organised by the MicroMountains Network technology initiative, the Schwarzwald-Baar-Heuberg Chamber of Commerce (IHK) and other partners. The Forum is also supported by the Cluster MicroTEC Südwest, the IVAM microtechnology association, the Hahn Schickard Society, the Furtwangen University of Applied Sciences and the Enterprise Europe Network of the European Commission.

The **MicroMountains Network** is a high-tech initiative set up by the Schwarzwald-Baar-Heuberg industry location that was itself established by the IHK. Its activities focus mainly on medical, ultra precision and microsystems technology with the goal of sustainably advancing the performance and efficiency of industry. The association initiates and carries out programmes designed to accelerate innovations. It promotes the cooperation between small- and medium-sized companies, supports start-up companies from the initial business idea to market entry and attracts young professionals by organising competitions and sponsorship.

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Press release

08-Mar-2010
Source: IHK Schwarzwald-Baar-Heuberg (26.02.10)

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