

**z-microsystems**  
a brand of z-werkzeugbau-gmbh



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z-microsystems is located in Austria, US and Canada specializing in micro-injection mold-making and injection molding of microfluidic consumables with over 15 years of experience in the industry.

z-microsystems' unique core competence is to support customers to transfer their individual designs of microfluidic devices into a part which is injection moldable. To get a first impression in most cases it makes sense to produce prototypes. Therefore z-microsystems has prototyping capabilities as e.g. micro-milling, stereo-lithography or special quick-tool and rapid injection molding technique inhouse. Based on this information we create a pilot tool concept around the customers' design and manufacture the pilot micro-injection molds – all in-house. These pilot molds are designed as a preliminary stage for the production mold. After first sampling the pre-production/pilot phase is carried out before taking the process into full mass production under clean room conditions.

A prime example came out of the partnership with the Swiss company rqmicro. rqmicro developed a pathogen separation and detection technology that delivers accurate results in less than one hour. By separating infectious bacteria with magnetic nanoparticles out of the sample matrix and quantifying them on the single cell level, it is possible to achieve superior test performance in water or food samples within minutes. rq-micro's users benefit from:

- ultrafast separation of microorganisms from complex samples
- real-time detection and quantification
- automated workflow for on-site testing

**The technology-base to achieve these goals is microfluidics.**

Microfluidics is a multidisciplinary field intersecting engineering, physics, chemistry, biochemistry, nanotechnology, and biotechnology. rqmicro uses a powerful combination of microfluidics and high gradient magnetic fields that allows target cells to be separated from a sample with high efficiency, using immunomagnetic separation (IMS) in contrast to conventional column-based methods. "Our approach separates target cells in a continuous and contact-free process, resulting in high recovery rates and an industry-leading



purity" reports Dr. Daniel Schaffhauser, CTO at rqmicro. Conventional IMS systems are labor intensive and lead to lower purity – especially in natural samples, where contaminants have a higher tendency to get stuck in the column.

The microfluidic consumable for rqmicro's application is manufactured and assembled by z-microsystems in Dornbirn, Austria. The plastic micro-injection-molded consumable allows 4 samples to be prepared simultaneously

**Passion for microfluidic & lab-on-a-chip**

z-microsystems is a well-respected research and development partner for "lab-on-a-chip" diagnostic & analytical consumables worldwide. It sounds like science fiction – but is already a reality. DNA tests, bacterial analyses up to and including tests for the risk of a cardiac attack are possible thanks to micro-sized labs. Point of care devices provide fast analysis directly at the patient's bedside. This trend is accelerated by increasing pressure to reduce costs with new medical technology. The vision: Quick tests for everyone. "lab-on-chip" applications are the future, and high-precision plastic parts produced by z-microsystems play an important role in this development. A solid pillar of your success: innovative tooling concepts and technologies applied competently.

**Design for analytics.**

**The basis of your success.**

z-microsystems uses an analytical approach to check the clients' designs for its manufacturability. In dialogue between our experts and the customer, a design is defined that perfectly fits to the customer's requirements and also matches with our tooling and injection molding capabilities. rq-micro's analytical cartridge is a good example how single sourcing simplifies and shortens communication, saves time and shortens the product development process (Design



for Manufacturing). In the decision-making process, z-microsystems relies on many years of experience supported by simulation software. "With an intensive dialogue between our customer and our team and the functional background of the customer's cartridge, the time to establish manufacturing processes can be reduced significantly. Smart tool concepts and ramping up supply chains lead to successful products and reduce the time to market for our customer."

**Perfectly designed.**

**The engineering think-tank.**

z-microsystems stands for flexibility and reliability when it comes to customized solutions. With over 60 years of experience in injection molding and an inspiring engineering team, every designed tool ends up with perfectly formed micro structures. Functional and precise. To fulfil our customers' requirements of precisely injection molded parts, various different technologies are employed in our molds

- injection compression molding
- vacuum technology
- variable temperature injection molding
- cube, rotary turntable and turning technology for multiple component injection molding

Thanks to a modular system and the use of standardized components, defined changes can easily be realized. Interchangeable parts and maintenance-friendly systems establish cost efficient operation during the whole life cycle of the product.

The tooling concept is the fundamental basis for a successful production and inspiring products, as seen in the rq-micro project.

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