Company profile

Benedikt Reichart*

Austrian small enterprise Microinnova GmbH receives "Process Intensification Award for Industrial Innovation 2015" from the European Federation for Chemical Engineering (EFCE)

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Walter Linhart, head of Microinnova's plant engineering department, received the award for the realization of production processes using "Flow Miniplant technology". This was developed by the Austrian chemical engineering and plant construction company. Flow Miniplant is an integrated, highly flexible and modular platform technology that analyzes and optimizes each step in the production chain of chemicals in relation to the desired outcome. Essential improvements result from the use of highly efficient continuous flow processes in microreactors as well as other intensification technologies. Flow Miniplant is particularly important for special and fine chemicals often used in pharmaceutical production. All necessary process steps from laboratory experiments to industrial level production can be developed using the same Flow Miniplant platform.

The evidence for innovation capacity and sustainability of the Flow Miniplant technology is demonstrated in the reaction of the markets. Already, Microinnova has sold two plants to the Scottish research center CMAC, which are already being utilized. Additionally, a further pharmaceutical plant has been sold to the Middle East, and currently, Microinnova is negotiating a new plant that will produce several hundred tons of pharmaceuticals.

The research project providing the initial impetus for the development of the Flow Miniplant technology originated in the Seventh EU Framework Programme. Dirk Kirschneck, Microinnova's chief executive officer (CEO) explains: "Without the cooperation in the COPIRIDE project we could not have achieved this success. In this particular case our colleagues at the Fraunhofer ICT-IMM in Mainz provided a special reactor for exothermal chemical processes, an essential part for this modular Flow Miniplant Process".

"Of course – everybody in our industry is talking about process intensification", comments Microinnova CEO Dirk Kirschneck. "But we have interesting results. In the project that received the EFCE award, we were able to produce the desired chemical in one minute instead of 12 h, equivalent to a factor 700. This impressed not only our customers, but also the EFCE jury. Without exaggeration I can say our Flow Miniplant technology usually provides better efficiency, a relevant cost reduction and quality improvements".

Microinnova is a small enterprise with 20 employees. The company is mobile, small and managed by the owners. The combination of these characteristics leads to innovation capability, a readiness to assume risks and, ultimately, success. Microinnova is a brainchild. According to General Manager Walter Linhart, "We knew the chemical industry needed novel approaches and concepts for production. We were evaluating promising methods and decided to focus on microreactors and continuous flow chemistry in combination with special intensification technologies, which turned out to be the right decision".

Continuous flow chemistry means that the reactions now take place in special tubes or mini reactors, instead of using big pots. Plants using this technology are much smaller but nevertheless exhibit increased efficiency and productivity. Continuous flow also provides other improvements. Reactions can now be controlled better, the products often have better quality, and production becomes safer. And that is exactly what Flow Miniplant is all about.

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Kirschneck and Linhart agree: “Continuous intensified processes are the future of the chemical and pharmaceutical production. Now we are among those leading this field”.

They are not the only ones with this assessment. Besides Big Pharma, which is Microinnova’s main customer, Prof. Dr. Peter Seeberger, director at the Max Planck Institute of Colloids and Interfaces in Potsdam, Germany, also shares their opinion. “We do basic research in the field of continuous flow chemistry. Microinnova collaborates with one of our spin offs, Artemiflow GmbH. They are optimizing our laboratory process for industrial scale production. We as scientists and researchers and the chemical engineers from Microinnova collaborate in an unconventional and success oriented style. It fits really well”.

Dirk Kirschneck often compares the Flow Miniplant technology to a Tesla Roadster. “When the Tesla team started to develop their e-vehicle, they did not just put a new engine into an old framework. They developed their car according to what an electric car can do best, compared to a common combustion engine car. The result is quite a rocket”. And then he adds, smiling, “As is our Flow Miniplant technology”.

Microinnova was founded in 2003 as a spin-off from the Technical University in Graz in the Science Park. Customers include companies such as Novartis and Roche. Microinnova puts effort into developing cost-efficient production methods for active pharmaceutical ingredients against diseases like malaria, HIV and cancer and also holds patents for processes replacing PET plastics with PEF, which is produced from renewable primary products.

Each of these products has the potential to make a difference for a better world.

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Background information

European Federation of Chemical Engineering (EFCE), www.efce.info

DI Walter Linhart (left), head of the plant engineering department, and CEO Dr. Dirk Kirschneck (right), next to one of Microinnova’s plants developed with the Flow Miniplant technology.