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PRESS RELEASE

WITTMANN BATTENFELD at the K 2013

“Power for the future” with a 2-component version of the *MicroPower*

In hall 16, booth D22, WITTMANN BATTENFELD is presenting the production of a “lab on a chip” as an impressive example from the field of medical technology to demonstrate a 2-component application of clean-room micro injection molding. The product is manufactured in a production cell consisting of 2 *MicroPower* 15 machines.

The equipment for this application consists of 2 *MicroPower* 15/10 machines connected with each other by a clean-room tunnel. The injection-molded parts are transported and joined together by the integrated W8VS2 Scara robots.

Here, both the special micro-structured surface of the molded part and the coordination of the interacting machines and their robot systems by the control system are regarded as special challenges. The molds are supplied by Microsystems UK (Fig. 1).

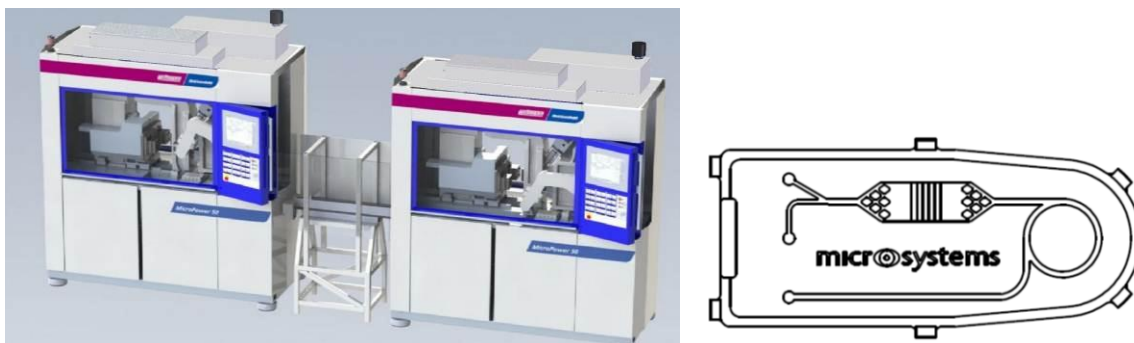


Fig. 1: Schematic image of 2C *MicroPower* and lab-on-a-chip drawing

In this production process, various components of the “check-card lab” are injection-molded, checked and assembled in the upstream *MicroPower*. The parts are subsequently deposited on a transfer module and transported to the downstream *MicroPower*, where the assemblies are picked up and inserted into the mold by a

combined insertion/removal handling system. Here, the parts are overmolded with TPE (thermoplastic elastomer), then removed and transferred to a depositing system.

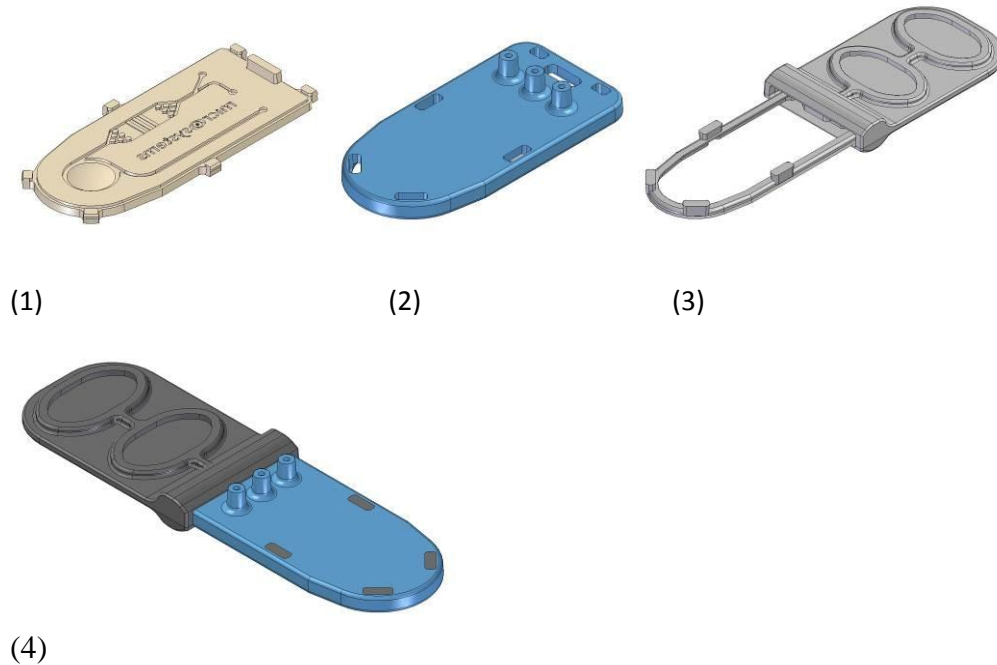
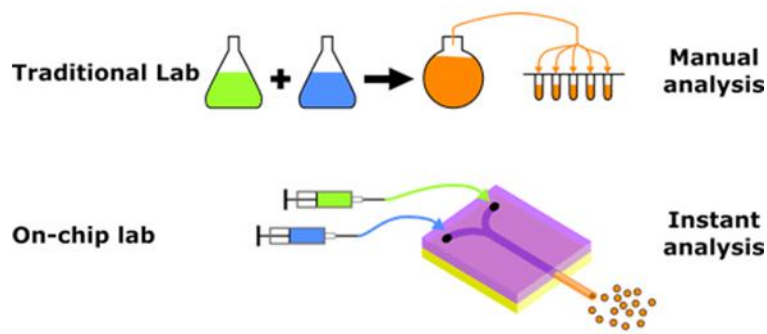


Fig. 2: Parts are formed and assembled in the injection molding machine on display (1 and 2) and subsequently overmolded in the downstream injection molding machine (3); finally, the finished part is removed and deposited (4).

The objective of this demonstration is to give trade visitors an idea of the *MicroPower's* capabilities and its flexible application options. Firstly, it shows the extremely high degree of precision with which micro parts and micro surface structures can be reproduced and manufactured in a stable injection molding process. Secondly, it highlights the outstanding flexibility of the *MicroPower* and its peripheral appliances. Thanks to these attributes, this specialized machine is able to accomplish even highly complex tasks.

Lab on a chip

The term "lab on a chip" normally designates a micro fluidic system which scales down certain selected functions of conventional labs (such as the separation of individual ingredients from a mixture) to the dimensions of a microchip, using only minute volumes of fluid (Fig. 3).



Redrawn from: Brivio, M., Verboom, W., & Reinhoudt, D. N. (2006). Miniaturized continuous flow reaction vessels: influence on chemical reactions. *Lab on a Chip*, 6, p. 329.

Fig. 3: Comparison of a conventional lab with a lab-on-a-chip system

With this technology, fluids such as blood can be completely and automatically analyzed on a single chip. Transport of the samples between the various reaction and analysis chambers is effected by capillary forces.

From the engineering point of view, lab-on-a-chip systems can be regarded as a sub-category of micro-electromechanical systems, which combine miniaturized sensor systems with micro fluidics. This involves special challenges in terms of structuring and finishing component surfaces and modifying their electrical attributes.

The *MicroPower* is the machine model of the *PowerSeries* from WITTMANN BATTENFELD specially designed for injection-molding nano and micro parts. The specially remarkable feature of the *MicroPower* is the innovative two-step screw-and-plunger injection unit with a shot volume range from 0.05 to 4 cm³. Via this injection unit, thermally homogeneous melt is injected with the result of premium-quality parts from absolutely stable production with short cycle times. Thanks to the all-electric *MicroPower's* excellent clean-room compatibility, this machine is particularly predestined for medical technology applications.



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The WITTMANN Group

The WITTMANN Group based in Vienna/Austria is one of the world's leading manufacturers of robots and peripheral equipment for the plastics industry. The WITTMANN product portfolio includes robots and automation equipment, automatic material loaders and material dryers as well as equipment for plastics recycling, mold tempering and cooling, and volumetric and gravimetric metering appliances.

WITTMANN BATTENFELD, a company of the WITTMANN Group with its headquarters and production facility in Kottlingbrunn (Lower Austria), is a leading manufacturer of injection molding machinery and equipment for the plastics industry. The company is present in about 60 countries with its own sales and service companies as well as representative offices, thus offering optimal support to its customers in all matters concerning injection molding technology.

WITTMANN BATTENFELD at K 2013: hall 16, booth D22

WITTMANN ROBOT SYSTEME at K 2013: hall 10, booth A04

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