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## **Micro Assembly Injection Moulding New Aspects in Manufacturing Hybrid Micro Systems**

*W. Michaeli, D. Opfermann*

*Institute of Plastics Processing, RWTH Aachen University, 52056 Aachen, Germany*

The miniaturization of technical products is becoming more important in many technological disciplines. Some technical functions can be optimized or even generated by the use of micro systems. More functions can be integrated on less space and without interfaces the reliability of the system increases. In the same term, a high potential of weight and volume reduction can be achieved. Some products that have already found their way into market like inkjet printer heads, airbag sensors or bio-medical devices.

Since polymer materials offer a wide range of properties that can be chosen according to the functional necessities, these materials are often decisive elements in micro systems. Injection moulding as a production process for polymer materials provides potentials like the integration of functions and process steps. For example injection moulding can also be used as a joining and assembly process in addition to generating micro parts. This technology offers a high potential for micro technology, since an offline joining process can be avoided by overmoulding of the components. Both, adhesion forces and diffusion processes, play an important role within the process. It is possible to generate movable and force-fit connections. For the specific overmoulding process, an appropriate mould technology has been developed, which is based on two-component and insert technologies. Investigations described in this paper focus on the process by characterizing the influence of temperature, injection moulding parameters and material combinations as well as the behaviour and influence of inlay parts. Different test structures are presented, like two-component hinges, functional fluidic structures and micro optical fibre connections. Present research at IKV focuses on progress made in the attainable bond strength of hybrid micro systems. A specific testing method has been developed to evaluate the bond strength.

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