

## PRESS RELEASE

Aachen, September 2010

### **Hybrid Production – Bringing Power to Plastics**

#### IKV to present innovative combination at K 2010: the die casting of metal and the injection moulding of plastics

Combining different processes to create a single-step process makes it possible to combine different materials and thus different functionalities in one moulded part. The Institute of Plastics Processing (IKV) at RWTH Aachen University is currently developing a new and efficient process chain for the production of electrically conductive plastic/metal parts. The innovative aspect of this project is the processing of the plastic and the metal in a hybrid, single-step multi-component injection moulding process. The new process will be showcased for the first time on the IKV stand (hall 14/C16) at K 2010, due to take place from 27 October to 3 November 2010, in Düsseldorf under the motto "Hybrid Production – Bringing Power to Plastics".

Together with ten partners from industry, IKV will present a specially developed demonstrator. The research group has designed a pair of sports glasses specifically to demonstrate the advantages of the hybrid multi-component injection moulding process. The lenses are heated by a conductor track to prevent condensation. The IKV research team is able to make the flow of electricity indirectly visible via the heat discharge. In addition, the demonstrator shows that there is considerable design freedom of the geometry of the conductor track and that a reliable contact between the inserts and the metal component can be achieved.

To manufacture the glasses, IKV has integrated a special machine for the processing the low-melting metal alloy into a K-Tec 200 S/2F injection moulding machine from Ferromatik Milacron GmbH, Malterdingen, Germany. An injection unit originally designed for plastics processing is used (Babyplast add-on injection unit, Christmann Kunststofftechnik GmbH, Kierspe, Germany). It has been fundamentally modified and optimised for processing the low-viscosity metal alloys.

Based on technologies for multi-component injection moulding IKV has, together with Gebr. Krallmann GmbH, Hiddenhausen, and HASCO Hasenclever GmbH + Co KG, Lüdenscheid, both Germany, developed a three-station index plate mould. With the aid of this moulding tool, the glasses are produced in a compact production cell with only one mould and one machine.

The temperature of the cavity inserts in the individual stations of the index plate mould is controlled with water via separate circuits. To enable processing of the extremely fast solidifying low-melting metal alloy in the area of the conductor track, the mould is equipped in the second station with an innovative, highly dynamic variothermal temperature control system from gwk Gesellschaft Wärme Kältetechnik mbH, Kierspe, Germany.

For the production of the glasses, the IKV team uses the polyamides CX 7323 (lens) and CX 9704 (frame) from Evonik Industries AG, Essen, Germany. The inserted metal alloy has a melt point below 200 °C and is noted for its high electrical conductivity in the range of  $8 \times 10^6$  S/m. This makes it particularly suitable for the production of conductor tracks with a high ampacity.

A KKT 55 drying and conveying system from Koch GmbH, Pforzheim, Germany, carries the materials to the production cell. Sensor technology from Kistler Instrumente AG, Winterthur, Switzerland, is used for the on-line monitoring of the pressures and temperatures in the mould and add-on unit. The automated process is supported by a six-axis robot, model KR5 arc, from KUKA Roboter GmbH, Augsburg, Germany. The combination of the robot with a special gripper from ASS Maschinenbau GmbH, Overath, Germany, guarantees a reliable insertion of the contactable inserts and removal of the finished glasses.

The process is being developed as part of the Cluster of Excellence "Integrative production technology for high-wage countries" at RWTH Aachen University.

**The IKV stand is in hall 14/C16.**

**[www.ikv-aachen.de](http://www.ikv-aachen.de)**

**Contacts:**

Dipl.-Ing. Oliver Grönlund  
Telephone: + 49 (0) 241 80-93827  
E-mail: [groenlund@ikv.rwth-aachen.de](mailto:groenlund@ikv.rwth-aachen.de)

Dipl.-Ing. Andreas Neuß  
Telephone: + 49 (0) 241 80-93827  
E-mail: [neuss@ikv.rwth-aachen.de](mailto:neuss@ikv.rwth-aachen.de)

Dipl.-Ing. Moritz Gründler  
Telephone: + 49 (0) 241 80-93981  
E-mail: [gruendler@ikv.rwth-aachen.de](mailto:gruendler@ikv.rwth-aachen.de)

Dipl.-Ing. Johannes Wunderle  
Telephone: + 49 (0) 241 80-93979  
E-mail: [wunderle@ikv.rwth-aachen.de](mailto:wunderle@ikv.rwth-aachen.de)

**About the IKV**

The IKV Institute of Plastics Processing at RWTH Aachen University is one of the biggest institutes engaged in this field of research. The Institute has more than 300 employees working on the problems encountered during the processing of the many different types of plastics that are now available. The IKV's excellent contacts with industry, together with its outstanding facilities, ensure that students benefit from a comprehensive, practically oriented course of study. Plastics engineering graduates from the IKV are thus sought-after experts in industry. Around 50 percent of German plastics engineers with a university degree have received their education at the IKV. In organisational terms, the IKV is divided up into the four specialist departments of Injection Moulding and PU Technology, Extrusion and Further Processing, Part Design and Materials Technology, and Composites. The Institute also takes in the Centre for Analysis and Testing of Plastics, and the Training/Skilled Crafts department. It is run by an Association of Sponsors, which currently has a membership of about 250 plastics companies from all over the world. The members of the Association of Sponsors exploit their cooperation with the Institute to ensure that they benefit from new developments at a particularly early stage. Professor Dr.-Ing. Dr.-Ing. E.h. Walter Michaeli is Head of the Institute and Managing Director of the Association of Sponsors. He also holds the Chair of Plastics Processing at the Faculty of Mechanical Engineering at RWTH Aachen University.

**Technical contact**

Institut für Kunststoffverarbeitung (IKV)  
an der RWTH Aachen  
Dipl.-Ing. Andreas Neuß  
Head of IKV Department Injection Moulding  
Pontstr. 49  
52062 Aachen, Germany  
Telephone: +49 (0) 241 80-93827  
Telefax +49 (0) 241 80-92262  
E-mail: [neuss@ikv.rwth-aachen.de](mailto:neuss@ikv.rwth-aachen.de)  
[www.ikv-aachen.de](http://www.ikv-aachen.de)

**Press contact**

Institut für Kunststoffverarbeitung (IKV)  
an der RWTH Aachen  
Ulla Köhne  
Public relations  
Pontstr. 49  
52062 Aachen, Germany  
Telephone: +49 (0) 241 80-93672  
Telefax: +49 (0) 241 80-92660  
E-mail: [koehne@ikv.rwth-aachen.de](mailto:koehne@ikv.rwth-aachen.de)  
[www.ikv-aachen.de](http://www.ikv-aachen.de)



Demonstration part for hybrid production with conductor tracks in the lens (graphics: IKV)