PRESS RELEASE

Integration enables efficiency and innovation

Combination of technologies and processes offers potential for profile production

The in-topic of integrative plastics technology combines a good knowledge of materials with process engineering, functionalities and simulation methods. The aim is to make processes more efficient and to find new products. The Institute of Plastics Processing (IKV) at RWTH Aachen University has been working for some time now on the highly promising potential of integrative plastics technology and will again this year demonstrate new possibilities during the International Colloquium Plastics Technology.

Because expert knowledge provides the necessary basis for integrative plastics technology, IKV benefits enormously from the wide-ranging expertise it has in the fields of materials and plastics processing when it comes to combining different technologies. Taking the example of profile extrusion, three examples can be shown that demonstrate IKV's interdisciplinary knowledge and the potential of integrative plastics technology:

The design of profile extrusion dies has so far been carried out predominantly through complex iteration loops in simulation and experiment. The reasons for this are the complex rheology of the polymer and the viscoelastic swelling at the die orifice, which make it impossible to determine the ideal die geometry directly from the dimensions of the desired profile. For this reason, a fully automatic simulation environment was developed that couples the computing domains inside and outside the extrusion die with each other, and then connects them with the two optimisation steps "determine quality" and "amend geometry". In this way, it is possible to determine an ideal, free-formed die geometry for a given profile without any human intervention.

The second example is the combination of material and product properties: New functionalities for profiles can be achieved through compounds developed at IKV, which give the normally insulating plastic both thermal and electrical conductivity. A holistic view ensures that the compound has both good processing and application properties.

The InPulse process is further proof of integration. It links pultrusion with profile extrusion. Continuous fibres, the resin and the thermoplastic outer layer are combined with one another in one and the same die. The die is designed to take account of the properties of the basically different materials. The outer layer material ensures in the finished part that the resin and fibres are protected from the influence of media and also from impact stresses.

www.ikv-aachen.com
www.ikv-colloquium.com

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About IKV

IKV, the Institute of Plastics Processing at RWTH Aachen University, is Europe-wide the leading research and education institute engaged in the field of plastics processing enjoying outstanding reputation. More than 300 staff are employed in finding solutions to problems connected with processing, materials technology and part design in the plastics and rubber industries. IKV's close contacts with industry and science, together with its outstanding facilities, enable cutting-edge research in plastics technology and ensure that students benefit from a comprehensive, practically oriented course of study. Plastics engineering graduates from IKV are thus sought-after experts in industry. In organisational terms, IKV is divided up into the four specialist departments of Injection Moulding, Extrusion and Rubber Technology, Part Design and Materials Technology, and Composites and Polyurethane Technology. The institute also takes in the Centre for Analysis and Testing of Plastics, and the Training and Further Education department. IKV is run by an Association of Sponsors, which currently has a membership of about 290 plastics companies from all over the world. Univ.-Prof. Dr.-Ing. Christian Hopmann 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.

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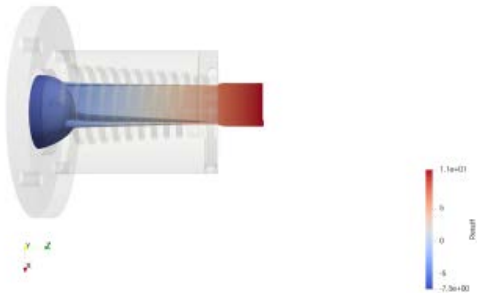

Integrative simulation chain of automatic die design and swell simulation (photo: IKV)

Photo in high resolution to find on our website www.ikv-aachen.de/en/news.