

A Varied Menu

Reason to Celebrate 30th International Colloquium of Plastics Technology and 70 Years of the IKV

For the Institute of Plastics Processing (IKV) at the RWTH Aachen University, Germany, 2020 is an anniversary year in three different ways. The RWTH Aachen University is celebrating its 150th anniversary, and is marking the occasion, by hosting the International Colloquium of Plastics Technology for the 30th time – with special feature on the previous day. A preview of the celebrations.

The 30th International Colloquium of Plastics Technology will take place on March 11 and 12, 2020, at the Eurogress Aachen, Germany. To mark the anniversary, on March 10, the IKV is also hosting the "International Symposium on Plastics Technology" in the VIP area of the Aachen Soccer Stadium. The IKV Colloquium presents the full gamut of IKV research and targets its practically oriented research primarily at the plastics industry. The symposium, on the other hand, offers talks by scientists from 14 countries with the aim of promoting scientific discourse between scientists and industry.

The key topics of the Colloquium consist of the plenary talks on

- the circular economy,
- digitalization (plastics industry 4.0) and
- additive manufacturing.

The Colloquium's research topics are offered in 15 sessions. Each session comprises two talks from the IKV, accompanied by a keynote talk by an expert from industry (see Box p.7). The Colloquium talks are simultaneously translated into English.

The Symposium, which is held entirely in English, also covers topics such as the circular economy, plastics industry 4.0 and additive manufacturing, as well as lightweight design technologies, injection molding and extrusion. Professor Christian Hopmann, Head of the Institute, describes the different orientation as follows: "At the IKV, we always keep both aspects in view – knowledge-driven basic research and application-driven research for industry. We want



Institute Director Professor Christian Hopmann expects 800 participants to attend the 30th International Colloquium of Plastics Technology (© Hanser/C. Doriat)

our symposium to provide space for basic research and have therefore asked scientists from all over the world to present their projects and discuss them with other scientists and industrialists."

Live Research: From the Lecture Hall to the Pilot Plant

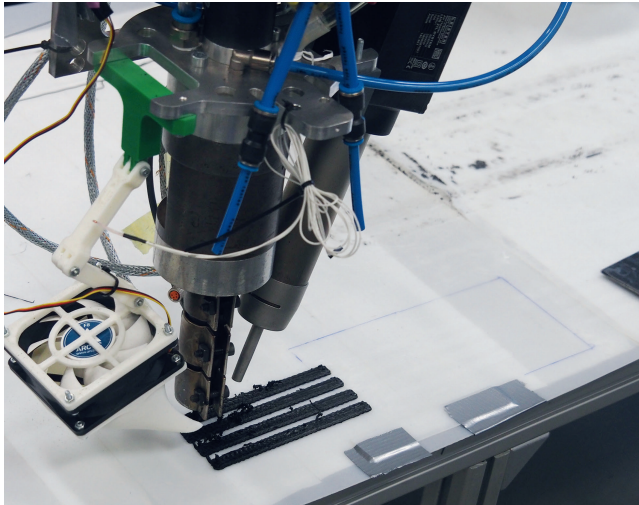
At the colloquium, application-driven research is particularly prominent in the "IKV 360°" program item. In the afternoon of the first event day, the IKV will open its doors to the colloquium participants, presenting its research activities live in its

own pilot facilities and labs. The scientists will be available for talks alongside the running systems.

In mid-November, media representatives had the opportunity to inspect some of the systems. At one injection molding station, for example, a new method for automated and precision design of cooling channel systems in injection molds was presented. An optimization algorithm calculates the temperature distribution in the mold with the condition that the part should cool as uniformly as possible, with the most homogeneous density distribution

Fig. 1. In additive manufacturing, the previous layer is first heated in order to improve the layer bonding, and then the polymer just deposited is cooled to improve the dimensional stability

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possible at the end of the injection molding cycle. The result is used to compute a conformal cooling channel layout; iteration loops are no longer necessary.

The layer-by-layer build-up in additive manufacturing results in the disadvantage of worse mechanical properties in the build direction. To optimize the part properties, the IKV has developed a special heating/cooling system for the joining zone, which could be viewed at another station. Shortly before the current layer is deposited, the layer deposited previously is heated in order to improve the bonding between the two layers, and therefore the tensile strength in the build direction. The heating-cooling system has at its core an air heater, which heats the airflow to up to 650°C, and thereby heats the layer by convection. The air heater is installed in a hybrid

manufacturing cell, consisting of a screw extruder and a six-axis robot, and is combined with active layer cooling, which has a beneficial influence on the dimensional stability (**Fig. 1**).

In blown film extrusion, the melt throughput, and thus the productivity, are highly dependent on the degree of heat extraction from the tubular film. Another highly promising topic on the tour was the flexible and adaptive air-guidance system, which offers increased cooling performance in blown film extrusion. The newly developed system is connected downstream of conventional air cooling. Thanks to the flexible membrane, it targets and accelerates the flow of cooling air between the film bubble and the membrane, thereby forming the venturi effect. The venturi effect increases heat transfer to the cooling air and also improves the bubble stability (**Fig. 2**). According to the IKV, the system increases throughput during blown film extrusion by up to 32%.

Who Will Receive the Georg Menges Award?

Other fixed events at the Colloquium are the presentation of the Georg Menges award and the industry exhibition in the foyer of Eurogress Aachen. The latter offers exhibitors a platform for presenting solutions for the plastics industry and holding discussions with industrial partners. The IKV expects participants to include exhibitors along the entire supply chain – and around 800 technical experts from the global plastics industry. ■

Dr. Clemens Doriat, Editor

Colloquium with 15 Sessions

For the 30th International Colloquium on Plastics Technology, includes the following sessions:

- Injection molding set-up via human-machine interfaces and AI
- Throughput increase and quality assurance in packaging technology
- Simulation-based optimization of the mixing and mold technology in extrusion
- New testing and quality assurance methods for high-performance FRP
- Multiscalar material modeling to predict part properties
- Process and design optimization in additive manufacturing

You can find the complete program with all sessions and information at:

» www.ikv-kolloquium.de/en

Service

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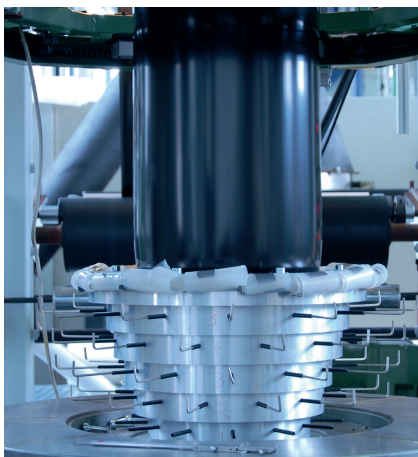


Fig. 2. Up to 32% more throughput in blown film extrusion is made possible by an innovative adaptive air guidance system (© IKV)