

## NEWS RELEASE

**Please do not publish before 1 September 2025**

### **IKV at K 2025**

Stand C16, Hall 14

#### Sustainable Production, Recyclate Processing and AI methods in the plastics industry

- Foam2Cycle: Fully recyclable soft-touch application with a high recyclate percentage
- Detect before Defect: Chill roll inspection system to improve quality and productivity in flat film extrusion
- KI4KI: Initiative to advance the systematic use of AI methods throughout the plastics value chain

Aachen, August 2025 – The Institute for Plastics Processing (IKV) in Industry and Craft at RWTH Aachen University will be presenting three forward-looking topics at K 2025 in Düsseldorf from 8 to 15 October 2025: The focus will be on the development of a sustainable, fully recyclable 2K soft-touch application, a roller inspection system for improving quality when processing recycled material in flat film extrusion, and a new initiative that supports companies in recognising, systematically evaluating and specifically utilising the potential of digitalisation and artificial intelligence.

#### **Foam2Cycle:**

##### **Profitable production of recyclable soft-touch lightweight components**

When developing multi-component soft-touch parts, design for recycling and reduction of the product life cycle CO<sub>2</sub>-footprint are particular challenges. At K 2025, IKV will be presenting a mechanically recyclable lightweight alternative for soft-touch applications that can compete with conventional soft-touch solutions both in terms of optic appearance and haptics. At stand C16 in hall 14, IKV will be producing soft-touch wrist supports for computer keyboards during the trade fair, demonstrating performance, series production potential and economic viability of the new production concept.

The wrist support consists of an injection moulded polypropylene carrier which is overmoulded with a thermoplastic elastomer as a soft component. This offers the great advantage of both components being thermoplastic and therefore recyclable together without prior separation. Besides a PP recyclate can be compounded from shredded wrist supports and used to produce new PP carriers. IKV will be demonstrating the implementation at the stand showing multiply recycled moulded parts with recyclate contents of up to 30 %.

Production is based on a two-component thermoplastic foam injection moulding process (TFI) with a chemical blowing agent. A “breathing” mould, whose cavity volume changes over the cycle, enables high degrees of foaming with high-quality surfaces. An insulating mould coating as well as imprinting the component within the mould, further improve the surface quality. Foaming can reduce the density of the carrier by around 8 % and that of the TPE by up to 80 %.

Low density of the components and recyclability of the composite result in a significantly improved CO<sub>2</sub>-footprint over the entire service life of the part. The use of established technologies and materials

ensures profitability of the process and a direct transferability to industrial use. At the stand a 100 % inline testing of the haptic and mechanical properties in the production cell demonstrates that the process is ready for series production.

The process is also intelligently set up, optimised and monitored live using a software from the digitalisation solutions developed by the IKV spin-off OSPHIM. The software is founded on AI solutions that were originally developed at IKV.

### **Detect before Defect:**

#### **Inspection system for tracking roll deposit formation during flat film extrusion**

To improve quality and productivity in flat film extrusion, IKV has developed an optical inspection system that can be used to track and evaluate the formation of deposits on the calender rolls during the running process. Early detection of deposit formation is crucial because deposits on the roller cause a reduction in film quality, which can lead to interruption of the production process. Especially when processing recyclates, the formation of deposits cannot be predicted due to batch fluctuations. Without monitoring, critical values are only recognised when rejects are already being produced and production has to be interrupted to clean the roller.

The inspection system developed at IKV can be easily and cost-effectively integrated into existing systems. It can also be coupled with an automatic roller cleaning system, which is triggered when a critical amount of deposit is detected. The inspection system is based on the optical detection of gloss changes on the roller surface caused by the deposits. A camera system integrated into the system generates an image of the roller surface for each roller revolution. An image processing algorithm then quantifies the deposit formation based on the grey values of the image so that the deposit formation can be tracked over the extrusion length.

The inspection system offers small and medium-sized enterprises (SMEs) in particular – which often rely on simple, robust production processes – the opportunity to detect critical roller deposits at an early stage and respond before rejects are produced or unplanned downtime occurs. With this system, IKV now has a test bench that enables the systematic investigation of interactions between plastics and roller surfaces using minimal material quantities. The insights gained serve as a basis for practical recommendations for industrial production.

The IKV booth will feature a simulation of the film extrusion process using a rotating chill roll fitted with the inspection system. The roller is prepared in sections with various deposits to simulate typical build-up effects.

As in the real process, the integrated camera constantly creates new images of the roller surface for live evaluation of the deposits based on the grey scale and for tracking deposit formation.

The development of the inspection system was part of the research project “Increasing productivity and film quality in flat film extrusion by preventing the formation of deposits on chill rolls”, which was nominated as a finalist for the IGF Project of the Year 2025.

### **KI4KI –Artificial Intelligence for the Plastics Industry**

Digitalisation and AI methods offer realistic solutions to meet the numerous challenges facing the industry in a future-proof manner. With its expertise in this field, IKV has launched the initiative KI4KI - Artificial Intelligence for the Plastics Industry. It aims to promote the systematic use of AI methods

along the entire plastics product life cycle by creating a network of companies from the plastics and digital industries for the practical implementation of digital and AI-supported solutions.

By participating, companies gain the expertise to recognise the potential of digitalisation and artificial intelligence (AI), systematically evaluate it and use it specifically for their product development and production processes in order to gain sustainable competitive advantages.

KI4KI offers workshops and expert talks, practical technology demonstrations, bilateral consulting for AI strategies as well as a digital knowledge platform and community. As a systematic process it comprises four phases:

1. Analyse: Analysing status and potential based on anonymous interviews
2. Understand: Imparting practical basic knowledge about AI in plastics processing
3. Enable: Developing skills to identify and prioritise specific fields of application
4. Apply: Development of individual implementation strategies and transfer of AI applications into operational practice

KI4KI is aimed at all players along the plastic product life cycle: material manufacturers, mechanical engineers, software developers, product designers, plastics processors, testing laboratories, measurement technology manufacturers, IT and digitalization partners and raw material suppliers.

A particular focus is on AI-supported optimisation of the product development process, for example through virtual design, simulation-based methods and data-driven enhancements. Another important topic area is increasing efficiency and improving quality in production, for example through predictive maintenance, automated quality monitoring and data-based process monitoring. IKV will be demonstrating a practical implementation of this in the production of wrist support (Foam2Cycle) at its K 2025 stand. In addition, KI4KI deals with cross-cutting issues such as data management, regulatory requirements, data sovereignty and ethical aspects, thereby also supporting the strategic positioning of the companies involved in the digital transformation process.

IKV will be presenting KI4KI in detail to the general public for the first time at K. At stand C16 in hall 14, interested companies will find ample opportunity for a detailed discussion of AI methods and digitalisation for the plastics industry and participation in KI4KI with IKV's scientific staff.

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

[www.osphim.com](http://www.osphim.com)

## **IKV's K 2025 project partners:**

### **Foam2Cycle**

ALLOD Werkstoff GmbH & Co. KG, Burgbernheim	kiki Ingenieurgesellschaft mbH, Malsch	OSPHIM GmbH, Aachen
Arburg GmbH + Co KG, Loßburg	Kistler Instrumente AG, Winterthur/Schweiz	Polar-Form Werkzeugbau GmbH, Lahr
Eschmann Textures int. GmbH, Wiehl	LyondellBasell Industries Holdings B.V., Rotterdam	SIMCON kunststofftechnische Software GmbH, Aachen
GK Concept GmbH, Dresden	Meusburger Georg GmbH & Co KG, Wolfurt	Synventive Molding Solutions GmbH, Bahlingen
HB-Therm AG, St. Gallen	Motan Holding GmbH, Konstanz	Wirth Werkzeugbau GmbH, Helmbrechts

### **Detect before Defect**

<b>Project Partner:</b>
Reifenhäuser GmbH & Co. KG Maschinenfabrik
<b>Supporters:</b>
item Industrietechnik GmbH
Rauscher GmbH Bildverarbeitung
Carl Zeiss AG


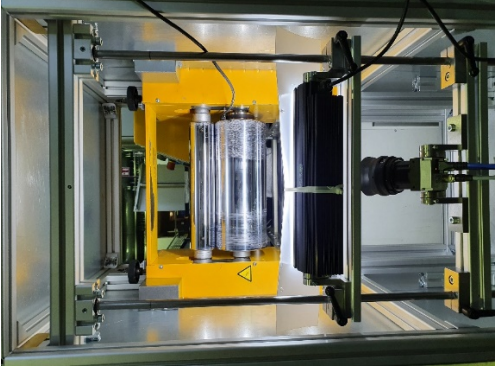

### **About IKV**

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 300 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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**Pictures:**

<b>Foam2Cycle</b>	
	<p><b>1_IKV_Foam2Cycle.jpg:</b> The fully recyclable soft-touch wrist support has ventilation slots and a soft, high-quality grained surface. Thanks to a flexible flap on the outside and an undercut on the inside, several rests can be joined together and adapted to the width of the keyboard. (Source: IKV)</p>
<b>Detect before Defect</b>	
	<p><b>2_IKV_Detect before Defect.jpg</b> The inspection system (front right) is fully integrated into the flat film extrusion line and makes it possible to track and record roll deposit build-up during the running process. (Source: IKV)</p>
<b>KI4KI</b>	
	<p><b>3_IKV_KI4KI.pdf</b> The <b>KI4KI - Artificial Intelligence for the Plastics Industry</b> initiative addresses all players along the value chain and aims to enable companies to assess the potential of digital and AI-supported solutions for their own applications and implement them in a practical manner. (Source: IKV)</p>