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FGCE07 I Open Area "The Power Of Plastics Forum"

**Press Release**

**Research on use of catalyzers in chemical plastics recycling**

# Twin Screw Extruder as Key Technology: University of Utrecht Making Advances in Chemical Recycling

*Stuttgart, June 2025* – The University of Utrecht has chosen a Coperion STS 25 Mc$^{11}$ twin screw extruder for a chemical plastics recycling research project. A research group headed by Assistant Professor Dr. Ina Vollmer will undertake comprehensive investigations of the mechanical-chemical conversion of mixed plastic waste using catalysts. Thanks to its intensive mixing effect and efficient energy intake, the Coperion STS twin screw extruder will assume a central function in this promising and relatively unexplored area.

At the K trade show (8-15 October 2025, Dusseldorf, Germany) Coperion, together with Herbold Meckesheim, will present their entire repertoire of technology for plastics recycling at Booth 9B34 in Hall 9 as well as in the Open Area in pavilion FGCE07.

## Efficient conversion of plastic waste using catalysts

Alongside proven solutions for mechanical plastics recycling, Coperion realizes plants for chemical plastics recycling. This process converts plastic waste back into high-quality raw materials, potentially making unlimited recycling possible. So far, the process is energy intensive and does not always result in high-quality products. Using catalysts could play an important role in the continued improvement of end product quality and process efficiency.

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The University of Utrecht's research project is dedicated to precisely this challenge. The STS 25 Mc$^{11}$ twin screw extruder, being installed there to carry out the experiments, processes waste plastic, shredded or compacted, with two co-rotating screws in a closed process section. Together, intensive dispersion and high shear introduce a great deal of mechanical energy into the material. The plastic is energy-efficiently melted – an advantage that is particularly important in chemical recycling. Moreover, the extruder achieves a very high mixing effect with its twin screws. The catalysts being implemented in this research project are distributed absolutely homogeneously throughout the plastic melt and can fully develop their intended effect.

In conventional pyrolytic processes, the hot plastic melt is prepared within the twin screw extruder for the next step in chemical processing: pyrolysis. There, in an oxygen-free environment, the plastic is broken down to its chemical building blocks. The temperature of the pyrolysis can be lowered thanks to the efficient use of catalysts, as Vollmer's team has shown in preliminary work.

Said Dr. Ina Vollmer regarding her research assignment: "Using the extruder, we can achieve an efficient use of the catalyst. Still, our vision is to allow pyrolysis to take place even in the extruder. We can achieve this by exploiting the mechanical-chemical reaction that occurs within the twin screw extruder, and specifically convert the polymer at lower temperatures than have previously been necessary for pyrolysis. Mixing with high shear in the extruder has a very positive effect on the use of catalysts. We are convinced that we can direct the chemical recycling process more precisely using lower temperatures, and this will lead to purer products while at the same time having the potential to revolutionize the chemical plastics recycling process sequence and save energy. "

Should the use of catalysts in the chemical recycling process prove its worth, the results of this research will easily be transferable to larger throughput ranges.

"Following Dr. Ina Vollmer's scientific approach, we will glean systematically researched results and draw conclusions for chemical plastics recycling from which we can all profit – recyclers and processors as well as end users," noted Leonid Liber, Sales Engineer at Coperion. "We are proud that our STS twin screw extruder is part of this promising research project, and we wish Dr. Ina Vollmer much success. We look forward to continued collaboration."

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**About Coperion**
Coperion (www.coperion.com) is a global industry and technology leader in compounding and extrusion systems, size reduction, washing, separating, drying, agglomeration, feeding, weighing, material handling and pneumatic conveying systems, as well as milling, mixing, thermal processing, dust collection and other services. Coperion develops, produces, and services plants, machinery, and components for the plastics and plastics recycling, chemical, battery, minerals, food and pharmaceutical industries. Coperion employs more than 5,000 people in its three divisions, Performance Materials, Food, Health & Nutrition, and Aftermarket Sales & Service - at over 50 sales and service locations worldwide. Coperion is an Operating Company of Hillenbrand (NYSE: HI), a global industrial company that provides highly-engineered, mission-critical processing equipment and solutions to customers serving a wide variety of industries around the world. www.hillenbrand.com

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**https://www.coperion.com/en/news-media/newsroom/**

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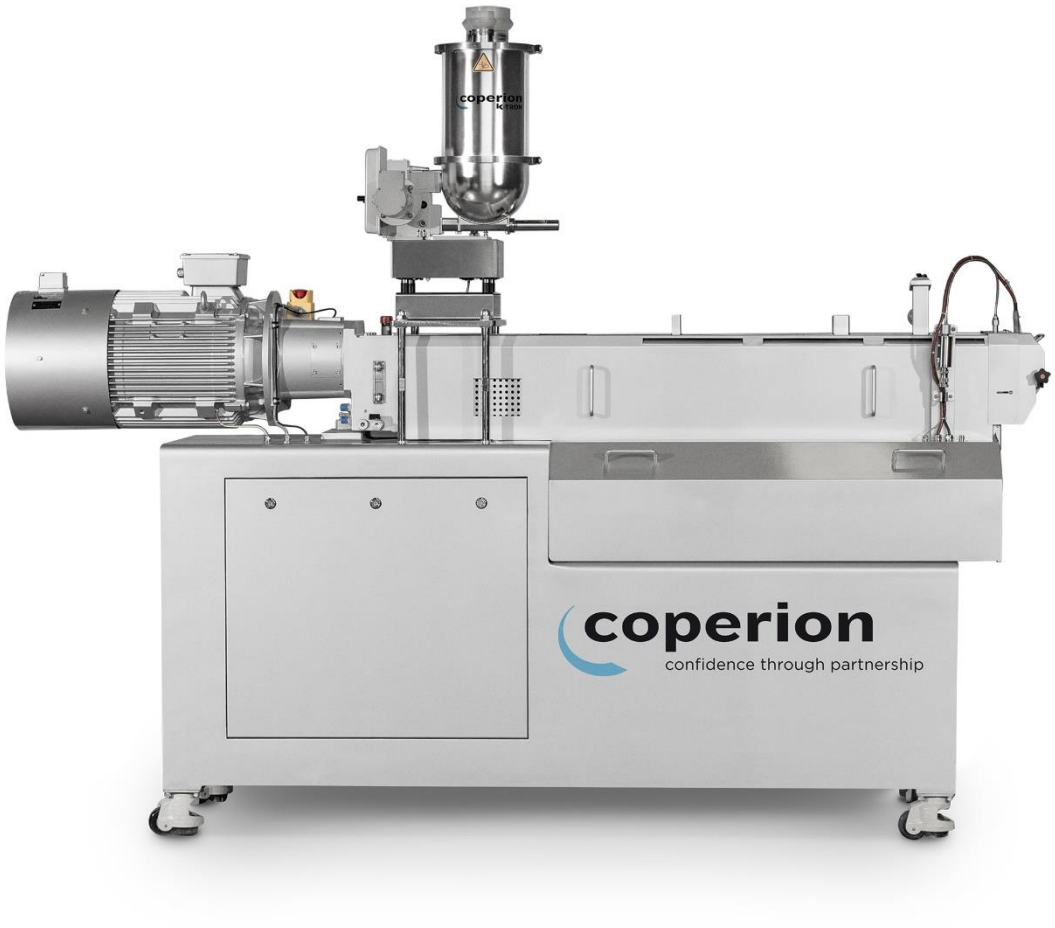


The Coperion STS 25 Mc$^{11}$ twin screw extruder is part of a research project at the University of Utrecht investigating the mechanical-chemical conversion of mixed plastic waste using catalysts.

*Photo: Coperion, Stuttgart Germany*