

Innovative technology solves multilayered problem: Recycling of multilayer packaging material from food and consumer goods

CreaSolv® - A substantial contribution to achieving the European recycling targets and its impact on the Paper Industry

Christian Makari, Sales Manager, GAW technologies

INTRODUCTION:

CreaSolv®, the award-winning solution-based recycling process, has the potential to be a game-changer in plastics recycling. The process's separation efficiency and cleaning power enable an almost complete material recovery of individual polymers from mixed plastics fractions and multilayer composites. For the first time, valuable secondary raw materials can be physically separated from fine and lightweight fractions of waste streams - gently and with virtually no impurities. A vision that is currently being put into reality in the post-consumer packaging recycling industry and in future could also be transferred into the paper industry separating plastics from waste paper or rejects.

Impact on Paper Industry

Due to increasing impurities in waste paper, primarily driven by the rise in multi-layer packaging, barriers and composites, a large quantity of non-paper materials (90% of which consist of plastic products), is generated during waste paper processing.

To avoid landfilling or critical thermal treatment and to tap additional sources of revenue, CreaSolv® can open up an innovative production pathway with its potential to remove and recycle plastics from pulper rejects.

The idea is that CreaSolv® will one day enable the versatile and flexible processing of post-consumer and post-industrial waste from the plastics and the paper industry into secondary raw materials, thereby optimizing the circular economy and reducing the CO₂ footprint.

The Process / How does it work

CreaSolv® is a solution-based polymer refining and recycling process. The target polymer (PE, PP, PA, TPE, etc.) is selectively dissolved from a fraction of mixed plastic waste.

- Insoluble polymers, debris and contaminants are removed from the solution through separation and filtration stages with a fineness of < 10 µm
- To recover the highly purified target polymer from the liquid solution, the solvent is evaporated
- In a closed loop the solvent is recondensed and reused in all following dissolving cycles
- The refined plastic finally is pelletized

The technology is already being implemented internationally. For example, Unilever operates an industrial pilot plant in Indonesia to produce secondary raw materials for consumer goods packaging.

Figure 1: CreaSolv®, The process.

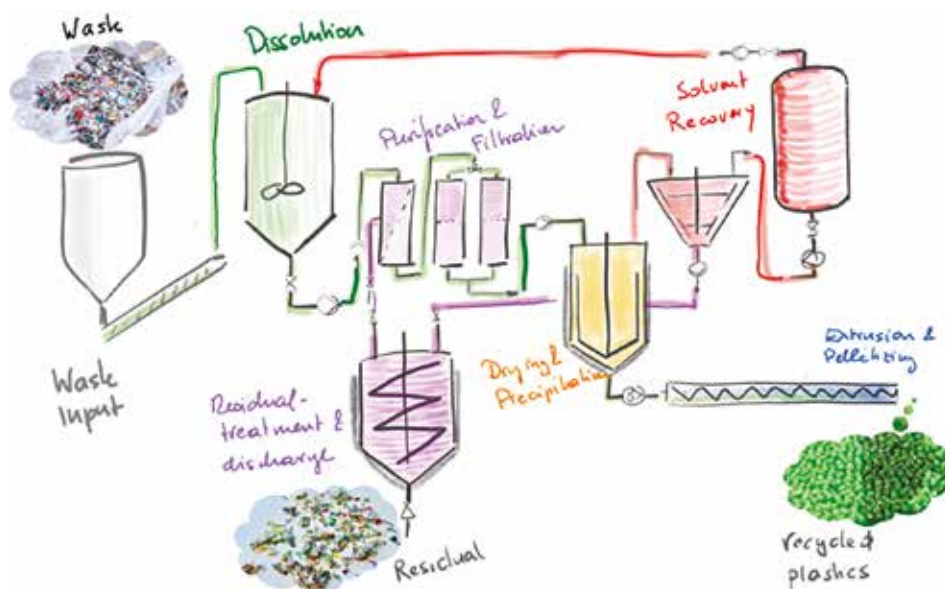




Image 1: CreaSolv®, The unit.

Results and Advantages

This process technology showed following results that lead to several advantages:

- The physical and chemical structure of the polymers remains unchanged during the physical dissolving process and does not degrade.
- Low thermal exposure of the polymers
- No exposure to mechanical stress (e.g., shear forces)
- No oxygen-induced molecular weight degradation
- The polymer can be stabilized during the process
- Highly attractive carbon footprint of the recyclate, compared to virgin material, landfill, incineration and other recycling paths
- The CreaSolv® Process has proven to be robust, simple and profitable to operate

Image 2: CreaSolv® dissolution process.

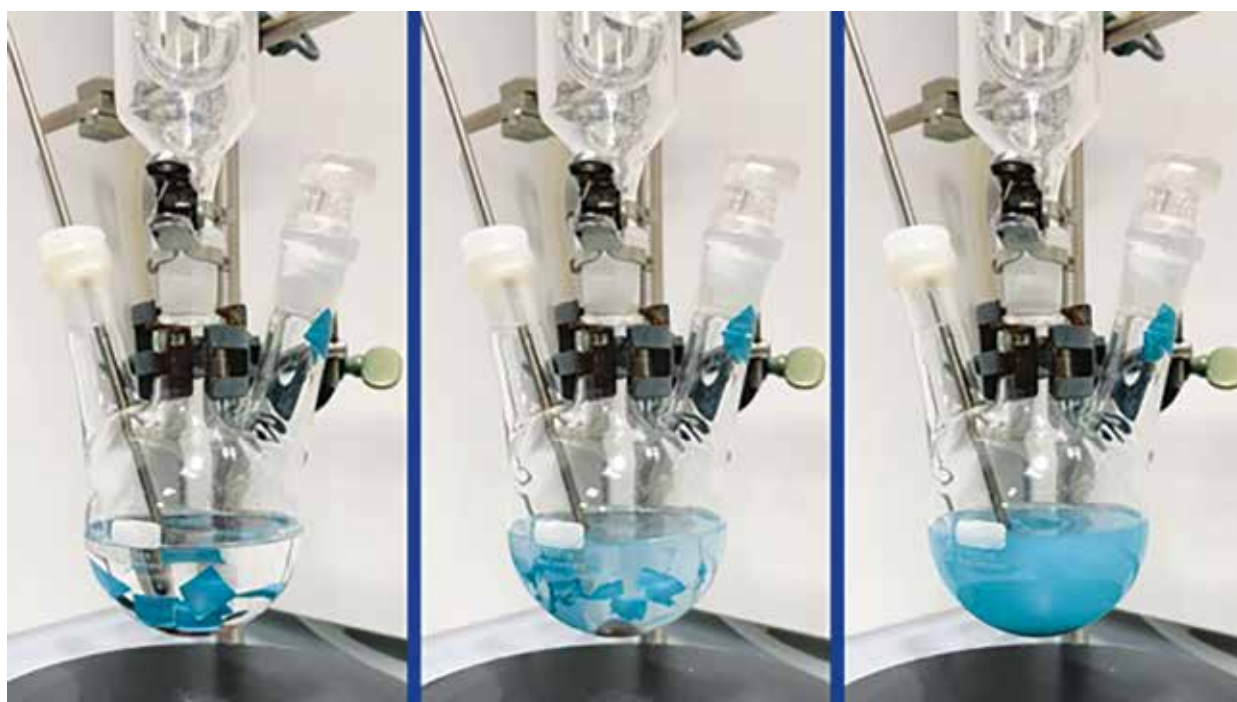




Image 3: An industrial demonstrator unit is in operation since 2021.

Demonstrator Unit

An industrial demonstrator unit is in operation since 2021, designed as a flexible multi-material plant for the experimental processing of various waste fractions and the production of industrially processable recyclate quantities.

- TRL 7; Capacity: approx. 100 kg/24 h
- Amount of recyclate produced to date: > 25 tons
- Processed waste fractions:
 - › PE from post-industrial film laminates
 - › PE from post-consumer packaging films
 - › PP from film laminates and packaging
 - › Glass-fiber-reinforced PP (separation of plastic and glass fibers)
 - › Glass-fiber-reinforced PA (separation of plastic and glass fibers)
 - › PE/PP combinations from artificial turf waste (separation and purification of PE and PP)
 - › PA from PA/PE containing post-industrial film laminates
 - › Separation of aluminum from PE-film laminates

All recyclates demonstrated excellent properties in industrial processing (up to 100% recyclate content is possible!)

An Award-Winning Process

GAW received a great honor and was awarded with the Innovation Prize Styria 2025 in the category Sustainability.

This award is not GAW's first recognition in this regard. In 2023, the company was named one of the top five finalists for the international innovation prize by the "Alliance to End Plastic Waste" in New York. The current accolade underscores GAW's consistent innovation and leadership in sustainability.

Statement from the management team of GAW technologies - Alexander Rinderhofer and Nina Pildner-Steinburg:

"This award is a special recognition of our company's innovative strength. It confirms that we are on the right track with our decision to invest in plastic recycling years ago. With CreaSolv®, we have developed a solution that truly meets the challenges of our time and can be implemented in several industries."



Image 4: GAW CreaSolv® awarded Innovation Prize Styria 2025 - picture credit Lunghammer.