

RECYCLING

Polyolefin Recycling at the Institute of Polymeric Materials and Testing (JKU) Application-Specific Recyclate Design

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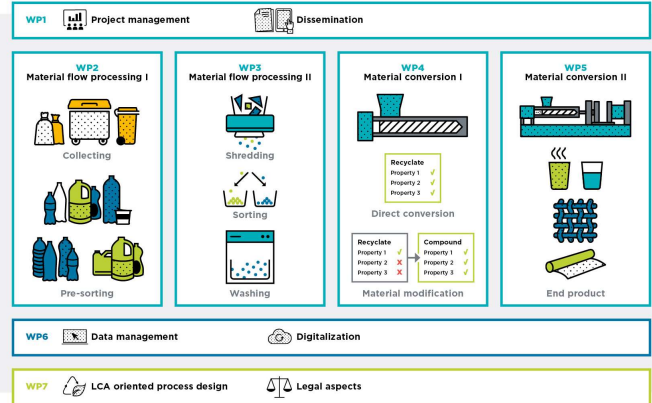


Flagship project circPLAST-mr

- 2022 – 2026
- 6.2 Mio. Euro
- 11 scientific & 14 industry partners

circPLAST-mr is a research project bringing participating partners together along with their existing expertise and an overall objective to significantly advance understanding and competence along the entire plastics recycling chain. There are four main objectives in the general research program:

- Identification of untapped potentials for mechanical plastics recycling
- Determination of essential processing steps at lab/pilot-scale
- Creating "specification-compliant" recyclates to ensure eco-efficient marketability
- Verification of scalability from lab/pilot scale to industrial scale

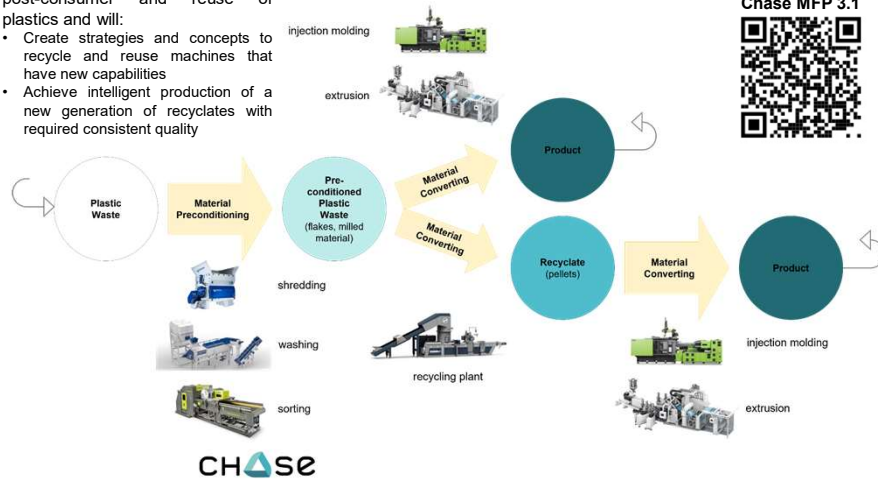


Chase MFP 3.1

- 2019 – 2023
- 2.5 Mio. Euro
- 3 scientific & 5 industry partners

MFP 3.1, "Data Knowledge and Product Performance Interaction in One-Step Recycling and Re-Compounding," focuses on the post-consumer and reuse of plastics and will:

- Create strategies and concepts to recycle and reuse machines that have new capabilities
- Achieve intelligent production of a new generation of recyclates with required consistent quality

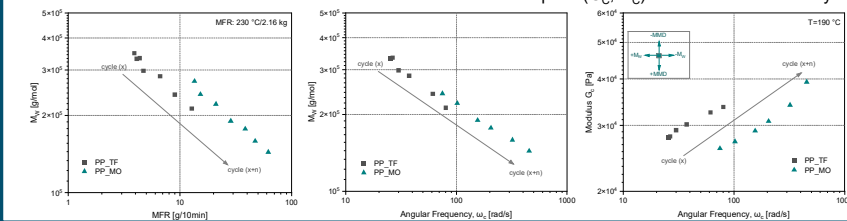


Chase MFP 3.1



Investigation of the Degradative Impact of Multiple Reprocessing Loops on the Rheological Behavior of Different Polypropylenes

by Akhras, M.H.; Langwieser, J.; Fischer, J. in Proceedings of the PPS-37, Fukuoka, Japan, 2022.



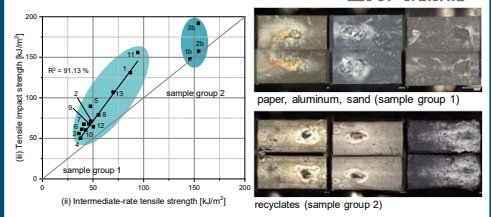
Mechanical reprocessing of PP inevitably leads to material degradation in form of chain scission. This can be clearly seen as a gradual reduction in molecular weight (M_w), an exponential increase in melt flow rate (MFR), and a change of the crossover-point (G_c, ω_c) measured via oscillatory shear flow rheology.



Influence of Macroscopic Contaminations on Mechanical Properties of Model and Post-Consumer Polypropylene Recyclates

by Traxler, I.; Fellner K.; Fischer, J. in Proceedings of the SPE ANTEC 23, Denver, CO, USA, 2023.

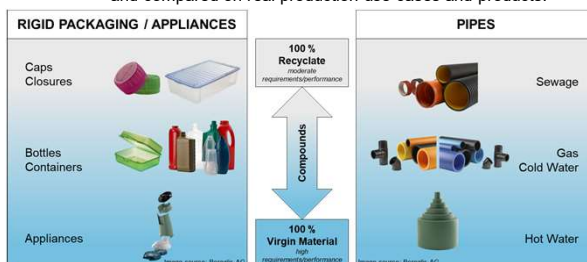
Intermediate-rate tensile tests (33 mm/s) and tensile-impact tests (2900 mm/s) on 5A specimen were used to determine the effect of contaminations commonly found in plastic waste on the mechanical properties of PP mixtures and PP recyclates.



Polyolefin Recycling

- 2018 – 2022
- 2.6 Mio. Euro
- 6 scientific & 2 industry partners

Polyolefin Recycling gained comprehensive knowledge of commercially available polyolefin recyclates. The use of recyclates (either pure, modified, or in compounds) in several applications was investigated. Life cycle assessments for mechanical and chemical recycling processes were conducted and compared on real production use cases and products.



Assessment of Commercially Available Polyethylene Recyclates for Blow Molding Applications by a Novel Environmental Stress Cracking Method

by Freudenthaler, P.J.; Fischer, J.; Lang R.W. in Polymers 2023, 15(1), 46.

Superimposed cracked round bar experiments were conducted on CRB specimens to assess the ESCR of PE-HD recyclates.

