

Critical challenges to move towards plastics circularity

Challenge 3: End markets for recycled polypropylene (PP) and mixed polyolefins (PP/PE) material

a. Overview/Objective

To develop and scale market applications for recycled polypropylene (rPP) and/or polyolefin blends (PP/PE) that currently face large technical, economic, and demand barriers, especially in higher value applications.

b. Context or Critical Challenge to Be Solved

The recycling of PP and its mixtures is limited by material variability, lack of standardization in formulations, and low demand for recycled products with stable properties, especially in food contact or high-throughput applications.

c. Priority Areas of Focus

- Technologies that allow different resins to be combined while retaining mechanical properties and barriers comparable to virgin resins.
- Innovations in machinery and filling processes that adapt to variable calibers of recycled materials that allow the efficient use of these resins as raw materials.
- Advanced recycling solutions (by dissolution, dry cleaning) that improve the quality of rPP and eliminate odor, color, or contaminants.
- Development of end markets for rPP and mixed polyolefins (PP/PE) in rigid, secondary or industrial packaging applications, with traceability and quality control.

d. Other areas of interest

- Recycling systems for flexible post-consumer PP that are scalable.
- Design of products that integrate rPP/rPE stably in their formulations (non-food packaging, furniture, construction).

e. General considerations for solutions

Solutions are required to consider compatibility with local recycling infrastructure, the availability of waste as raw material. In the case of mixed polyolefins, it will be valued that they include mechanisms to identify the proportion of materials in the mixture or that they demonstrate their recyclability and integration into high-value products, regardless of this proportion. **The technical validation of the proposed solutions is key, as well as their commercial viability and compliance with quality regulations (especially if food contact is sought).**