

Poster-Session

Plasma etching of recycled PET film in Roll-to-Roll (R2R) processing

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Europe's plastic recycling rate stands at 32 %, indicating progress in plastics collection and recycling. However, challenges persist in managing the increasing volume of plastic waste sustainably. This study focuses on replacing a PET heat reflector film in cargo containers with recycled PET (rPET) film material. The goal is to determine if low-pressure Ar/O₂ plasma pre-treatment of rPET can achieve adhesion comparable to virgin PET, making it suitable as a thermoformed heat reflecting layer. The investigation involves comparing low-pressure plasma etching of rPET to virgin PET for a large-scale R2R plasma reactor. Various parameters such as gas mixtures, etching durations, and sample sizes are explored, while preserving polymer properties. Thermoanalytical techniques and morphology analysis provide insights into the influence of particle bombardment from various plasma species on the polymers. Peel tests demonstrate successful adhesion of silver coatings on recycled PET film using R2R plasma processing, indicating potential for industrial applications in cargo containers and beyond.