

SUSTAINABLE MATERIALS, PROCESSES AND SYSTEMS FOR ENERGY TRANSITION

MUR DM117/AIZOON-Development and optimization of mechanical recycling processes of polyolefins aimed at achieving the requirements set by food-contact

Funded By	AIZOON SRL [P.iva/CF:09220780010] MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584] Politecnico di TORINO [P.iva/CF:00518460019]
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Context of the research activity	<p>The contest of the research activity is the green food packaging. The improvement of polymer packaging's sustainability requires the development of new technologies that allows the application of recycled polyolefins in food contact.</p> <p>The main topic analyzed is the mechanical recycling in which the main processing steps are polymer waste trituration/densification, washing and extrusion.</p> <p>This work starts with the analysis of the recycled polymer sanitization techniques and their effects in polymer stability and processability. It is important to analyze the potential contamination factors during the recycling processes and develop a plan to avoid any contamination in order to be compliant with the standards applicable in food contact packaging. The processing optimization is very important both for technical and economic issue. The use of digital tools for processing is a key topic of this work.</p> <p>Finally, this work requires the analysis of the scaling up to pilot and industrial level.</p> <p>Progetto finanziato nell'ambito del PNRR – DM 117/2023 - CUP: E14D23002050004</p>
Objectives	<p>The objectives of this PhD are:</p> <ul style="list-style-type: none">- To understand the sanitization techniques compatible with food contact requirements and polymers technical performance- To optimise the processing parameters in order to fulfil the technical and economic requirements for the recycled materials

- To understand the potential contamination factors during the processing and to develop a plan to avoid them
- To analyse the scalability of the technology to pilot and industrial level

Skills and competencies for the development of the activity

The ideal candidate should be a material scientist or engineer, chemical or physical engineer, a chemist or a physicist or equivalent degree. Expertise in advanced processes and material science, as well as problem solving ability and practical experience in laboratory would be an additional value. Candidates should have a strong motivation to learn through advanced research.