

Introduction

The main part of marine debris enters into the ocean from rivers. For that reason Clear Rivers has specialised in trapping and extracting floating plastics from rivers. From the river IJssel, lots of plastics are extracted and fashion shop Miramé wondered whether this low value waste could be upgraded into high value clothing. Together with our partners it was demonstrated that conversion into fashion clothing is technically feasible.



Clear Rivers Litter Trap

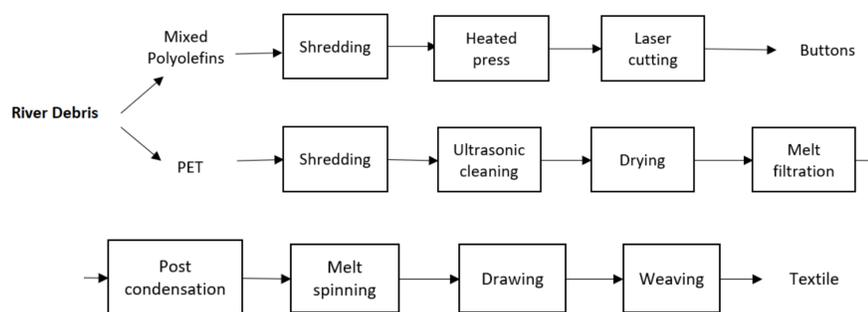
Objective

The objective of this project was to prove the technical feasibility of conversion of river plastics into fashion. Two sub streams were considered that way, to be combined in a demonstrator:

1. Convert Polyolefin waste stream into fashion components;
2. Convert PET waste stream into textile.

Process

The approach in this project was to conduct applied research on available machines and technology in order to empirically find out the technical feasibility for clothing production. Extracted waste streams were separated manually and conversion processes for both polymer streams were defined.



Since river plastics come from water, they were washed to a certain extend, and it was considered no to additionally wash polyolefins after shredding.



River plastics, sorted and shredded.

1. Polyolefins have a certain compatibility in a large melting range. We chose for in-mould heating so that colours of shredded flakes remain visible after processing.
2. For yarn spinning the PET material needed a melt filtration (100 mesh) and post-condensation step to reach an intrinsic viscosity of 0,65 dl/g. Filaments up to 1100 dtex were made by Senbis.

Results

1. Laser-cut components (in this case buttons) clearly showed their 'recycled looks' by its colour mix. The process turned out to be robust and less sensitive to contaminations.

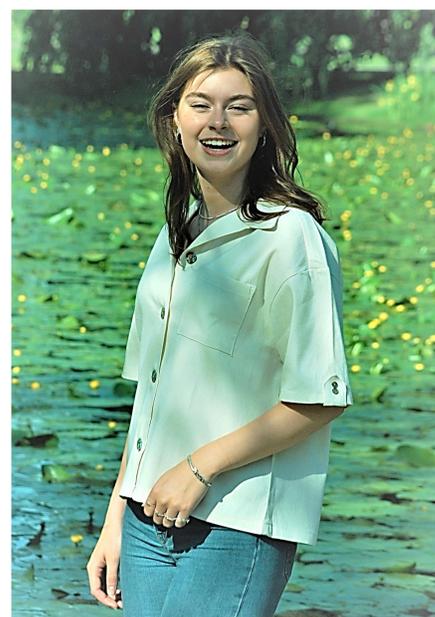


Buttons laser-cut from polyolefin plates while retaining its colours.

2. Melt contamination turned out to be huge despite the ultrasonic cleaning, and black spots were found in the yarn. AC Ter Kuile produced a weave under industrial conditions with cotton warp and 50% cotton weft.



Yarn and weave of river PET.



Blouse made of river waste!

By combining the outputs of both processes, a demonstrator blouse was sewn by the research group SFT.

Conclusions

The manufacturability of fashion from river plastics was demonstrated. In future work the yarn thickness versus the level of acceptable contamination is to be balanced. This could potentially result in an acceptable cost price for a business case.

Acknowledgements

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