EPA Green Enterprise

Project: PROBOT

Organisation: Irish Manufacturing Research • Reference No.: 2018-ET-CP-95

Project Objective: Examine the commercial viability of a novel Self Reinforced Polymer made from recycled PET plastic.

Amount Of Grant Aid Awarded: €93,000

Background:

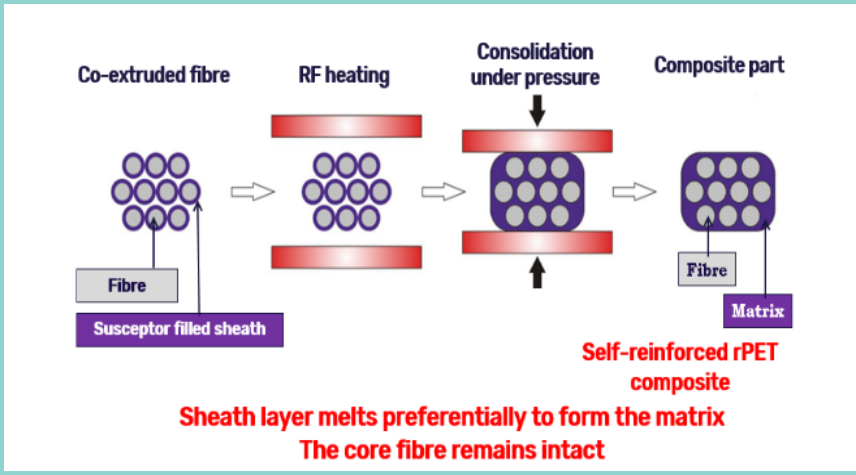
Plastic has become ubiquitous and Ireland is the largest consumer of plastic packaging with more than 60 kgs per year per inhabitant. As a consequence, more and more research projects are trying to find new uses for recycled plastics that would provide a higher value for this waste material.

IRISH MANUFACTURING RESEARCH

IComp Irish Composites Centre

Project activities:

In 2018, IComp developed a new plastic composite named SerPET, a Self-Reinforced Polymer (SRP) made in part with recycled PET. IComp teamed up with IMR to establish the commercial viability of the material and the business strategies needed.



The composite has a high-strength PET core with an easy-melting PET sheath surrounding it. This provides it with an optimal product strength. It is easier to process due to a much larger processing window than that of competitive SRPs, usually made with polypropylene. It is also very robust with a long lifecycle, and is fully recyclable, thereby aligning with circular economy principles.

In terms of potential usable material input, nearly 25,000 tonnes of PET plastic bottles are consumed in Ireland each year. In 2018, more than 10,000 tonnes of this PET waste was sent abroad for recycling, mainly to the UK and Turkey.

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Project Outcomes:

Using recycled PET for SRPs opens up new opportunities for higher value recycling. A wider thermal processing window could provide companies with a reduction in processing costs and waste levels during the manufacturing phase.
Incorporating recycled PET would enable companies to adopt this new SRP while improving their sustainability. A life cycle study on this PET evaluated that using rPET instead of virgin PET would reduce greenhouse gas emissions by 71%. Incorporating 25% of recycled PET into the product formulation would reduce greenhouse gas emissions by 18% compared to a virgin alternative.

Moreover, as Ireland generates nearly 10,000 tonnes of recyclable PET bottles, this composite could develop Ireland's strategic independence towards plastic recycling by retaining its value at home and creating employment.
The project found this composite can find applications in a variety of industries. Its main polypropylene-based competitor is currently used in sports equipment, suitcases, audio equipment, automotive equipment, and anti-ballistics equipment. Other possible uses identified include farm machinery and marine equipment.

Next steps needed:

Production scale-up should be encouraged for companies so as to determine the financial and environmental benefits embedded in the adoption of this composite at industrial scale. Other plastics could potentially be used to create an SRP by experimenting new technologies that would enable them to be solid enough to be considered viable alternatives to the current market leader.

For more on the EPA's Green Enterprise programme visit here
For more on the project see here