

Towards a New Generation of Glass Fibre Products Based on Regenerated Fibres Recycled from End-Of-Life GRP and GRP Manufacturing Waste

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The recovery and reuse of end-of-life glass fibre reinforced plastics in an environmentally friendly, cost-effective manner is one of the most important challenges facing the composites industry. In 2019 the global consumption of reinforcement grade glass fibre (GF) likely exceeded six million tons. Associated with this global GF consumption is the production of up to one million tons of GF manufacturing waste much of which is landfilled. Furthermore, approximately 70% of reinforcement GF is used to manufacture thermoset composites (GRP) which also produces approximately 15% manufacturing waste. Consequently it can be shown that there is sufficient GF available in current manufacturing waste together with end-of-life GRP to meet approximately 50% of the global demand for GF reinforcements. However, GRP waste is difficult to recycle in a cost effective manner and is also often landfilled. Such landfilling is rapidly becoming untenable due to legislative and pricing developments.

A number of processes for recycling GRP are available or under development. However, most options deliver recycled glass fibres (RGF) which are not cost-performance competitive due to the huge drop in performance of RGF compared to its original state. A breakthrough in the regeneration of RGF performance can potentially totally transform the economics of recycling GRP. The Advanced Composite Group at the University of Strathclyde has been working on this challenge for over a decade. This presentation will review the status of the ReCoVeR project which is focussed on enabling cost-effective regeneration of the performance and value of glass fibres obtained from thermal recycling of end-of-life GRP and GRP manufacturing waste. Highlights of our latest results will be presented with emphasis on our breakthrough ReCoVeR treatments which regenerate the properties of thermally recycled glass fibres for reuse as a composite reinforcement.

- Reuse of GRP waste is a major challenge
- Recycled glass fibre has very low level of performance (and value) as a reinforcement
- ReCoVeR restores performance and value of recycled glass fibre