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An Assessment of Financial Viability of Recycled Carbon Fibre in Automotive Applications

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Abstract

Carbon fibre (CF) recycling has been demonstrated to achieve reductions in environmental impacts compared to virgin CF production, but there is limited understanding of the financial viability of recycling and reutilisation of recycled CF (rCF). In this work, cost analysis and identification of market opportunities for rCF are performed by evaluating the cost of recycling, composite manufacture, and applications in automotive industry. Cost impacts of using rCF as a substitute for conventional materials and competitor lightweight materials are assessed over the full life cycle, including in-use implications. Recovery of CF can be achieved at $5/kg and less across a wide range of process parameters, approximately 15% of the cost of producing virgin carbon fibre. The life cycle cost results show that rCF composites, especially aligned rCF composites, give substantial cost reductions relative to virgin CF composites and even steel and aluminium.