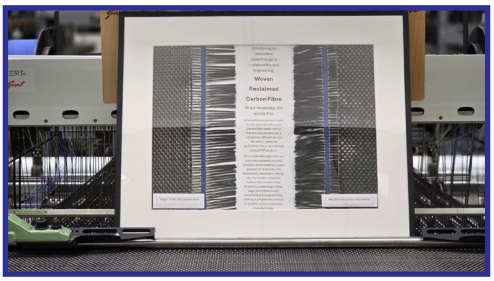
SUSTAINABILITY: CIRCULARITY

FINALIST: AMRC, NCC & Longworth



The world's first woven recycled carbon fibre fabric marks a major breakthrough in composite circularity. Developed through collaboration between Longworth, NCC, and the AMRC, this innovation demonstrates for the first time that continuous recycled carbon fibre (rCF) recovered from end-of-life filament-wound components can be rewound and woven using standard textile machinery.

The carbon fibre is recovered through Longworth's DEECOM® process, which removes resin without damaging the fibre. The liberated tows are rewound and processed into woven fabrics—50% recycled by fibre volume, with one rCF yarn successfully integrated into the warp, proving the feasibility of 100% rCF woven textiles in future production.

Unlike short-fibre non-woven mats, which offer limited mechanical performance, these woven rCF fabrics retain the strength, stiffness, and lightweight characteristics of virgin carbon fibre while cutting embodied energy by up to 80%. The development unlocks a circular supply chain, diverting carbon waste from landfill and reducing reliance on energy-intensive virgin fibre.

For end-users, this innovation delivers a sustainable, cost-effective material source amid tightening supply and rising demand for lightweight composites. It enables new high-performance applications in automotive, aerospace, energy, and sports sectors, while supporting UK and global net-zero targets.

Over 1,100 human-hours and £130,000 were invested in this work. Proven processability, promising scalability, and present readiness for further mechanical validation; the 5m of woven reclaimed continuous rCF fabric is a genuine step change in the circular use of advanced composites.

Learn more at: www.amrc.co.uk