Composites UK Trade Association

COMPOSITE BRAIDING

INNOVATION IN COMPOSITE DESIGN

WINNER: Composite Braiding Ltd

Composite Braiding Ltd (CBL) has successfully demonstrated the viability of applying thermoplastic composites to railway overhead line equipment (OLE) through the construction of a 8m tall prototype composite twin track cantilever (CTTC). Using high-rate braiding and consolidation techniques, the structure is almost entirely glass fibre reinforced nylon, eliminating the need for autoclaves and reducing cycle times and energy consumption by over 95%. Material waste is minimal, with up to 98% of braiding material reused in a circular manufacturing system, including recycled components. Thermoplastic composite rivets made of the same materials were also used.

The CTTC addresses a critical industry need: existing steel TTCs are heavy (1,700+ kg), expensive to transport, and require extensive foundations and access roads. CBL's design reduces mass by over 83% to just 277 kg, cutting installation times by more than 50%, improving worker safety, reducing emissions by over 80%, and enabling cost-effective onshoring of UK rail infrastructure. The thermoplastic design is electrically insulative, environmentally inert, repairable in service, and fully recyclable at end-of-life, supporting sustainable rail electrification.

The project was delivered through the 6-month Clean Futures 2 accelerator programme, supported by CPC and BCIMO with 50% match funding. CBL invested over 2,300 man-hours across design, process development, and manufacture, collaborating closely with Tier 1 partner including Amey, further supported by Keltbray, Skanska, and Unipart Rail. Amey facilitated installation at BCIMO, providing critical feedback and data to refine the next production iteration.

The CTTC demonstrates cutting-edge, scalable thermoplastic composite manufacturing, with a potential UK market of nearly 100,000 units and global export opportunities. By reducing carbon emissions, installation time, and costs, this innovation provides a transformative solution for rail infrastructure, supporting rapid decarbonisation and affordable public transport.

Learn more at: www.compositebraiding.com