

Award-Winning New Options for Composite Structural Beams



Composite Braiding

Location	Derby
Description	Composite structural beams, poles and tubes consisting of a range of composite fibres combined with thermoplastic matrices.
Client	n/a
The challenge	To produce composite structural beams at volume, with lower cost and with good sustainability credentials.
The solution	Development of a new processing capability for thermoplastic braided composite beams, poles and tubes, creating products ideal for use in civil engineering applications. This solution makes composite beams cost competitive with steel for the same or better performance.
Material used	Variety of fibres (carbon, glass, basalt) with a wide range of thermoplastics, suited to end-use requirements.
Specific design details	The beams can be from a few millimeters' diameter (for example for lattice structures) to over 750mm. They can be single pieces in lengths of several meters and can include internal structures, which through innovative design can cause products which would normally be under compression to work in tension, capitalising on the best properties of the materials. Geometries from simple section-straight components to complex curves of varying section are available.
Benefits	<ul style="list-style-type: none"> • Weight saving vs metals and pultruded sections – easier and safer to install, and lower environmental impact through delivery and installation • Optimised structural design, including the ability to use complex geometry and curvature. • Tougher than thermosets, with ductile failure mode, preferable to brittle failure • Corrosion resistant and longer life • More joining options including welding, improving joint integrity and reducing complexity at end-of-life • Electrically insulated or conductive – we have materials that can do both • Low maintenance • Fire resistant materials available • Antimicrobial materials available • The materials are recyclable, re-usable and capable of being repurposed • Processing waste demonstrated at <1%
Measurable outcomes	Composite Braiding can consolidate a 4m long, 250mm diameter beam in only 15 minutes, with a 92% energy saving vs oven processing. To braid the beam, the company will have been making the preform at rates of a mile per day. This equates to c. 55 kg CO2e savings per 4m beam (RenSMART). Composite Braiding can consolidate a 1.9m long 35mm diameter pole in less than 5 minutes, using 98% less energy. This equates to c 16 kg CO2e savings per 35mm pole.
Further details	www.compositebraiding.com