

Patented manufacturing process (Rapid Tow Shearing) for advanced carbon fibre composites which are lighter, stronger and more cost-effective than the state-of-the-art processes.

Summary

Profile type

Technology offer

Company's country

United Kingdom

POD reference

TOGB20240102009

Profile status

PUBLISHED

Type of partnership

**Research and development
cooperation agreement**

**Commercial agreement with
technical assistance**

Targeted countries

• **World**

Contact Person

[Alice MOROSINI](#)

Term of validity

2 Jan 2024

1 Jan 2025

Last update

2 Jan 2024

General Information

Short summary

The UK company has developed the world's first composites automated manufacturing process that can place wide carbon tapes along curved paths (fibre steering) without generating defects. They are looking for tier 1 OEM (Original Equipment Manufacturer) partners in the automotive, aerospace or space sectors to collaborate on research focused on fibre steering composites structures. They are also interested in commercial partnerships within these industries.

Full description

The UK company is a Bristol University spin-out which has developed the Rapid Tow Shearing (RTS) process.

RTS is the world's first automated composites manufacturing process that can place carbon fibre tapes along curved paths without generating defects. Its defect-free fibre steering capability realises ultra lightweight composite structures beyond the limit of the conventional straight fibre designs and complex geometry which is not manufacturable using current automated manufacturing technologies.

RTS can enable the manufacture of ultra-lightweight composite structures minimising the weight, production costs

and environmental footprint of composite structures.

The UK company's ambition is to become a world-leading Manufacture-as-a-Service (MaaS) company, providing end-to-end manufacturing solutions including the hardware, software and engineering expertise to go all the way from concept to production of fibre steered (RTS) composite structures across a range of industries (aeronautics, automotive, space).

They are targeting the global lightweight composite materials market with a focus on aerospace, automotive, space and wind turbine sectors.

Current products/services and customers:

- Design tools for fibre steered components: finite element analysis based structural and manufacturing process in-house models appropriate for designing RTS composite components
- 2D RTS machine able to manufacture flat fibre steered preforms which can then be formed to final shape via a forming mechanism (press etc..)
- 3D RTS machine (under development) for direct deposition into mould

The UK company is looking for new industry partners (tier 1 OEM) in the automotive, aerospace and space sectors to collaborate under a research cooperation agreement or under a commercial agreement with technical input from the OEM.



Advantages and innovations

As composites are anisotropic, it is more efficient to design with curved fibre layers (fibre steering), changing their orientation constantly to follow the load path and the geometry of the components. Current automated composites manufacturing machines have limited steering capabilities and rely on bending tapes to steer their paths, leading to localised defects and must be done at slow speeds. The design space is therefore limited, and effective fibre steering is imperative to achieve low cost lightweight parts.

The UK company's technology offers an improvement in producing lightweight (up to 65% weight savings) and cost efficient (reduced raw materials & production time) composite structures for the composites industry based on the world's first automated tape laying machine with fibre steering capabilities.

This technology can improve fuel efficiency and reduce CO2 emissions for planes and cars, while the cost reduction can further increase the adoption of composites and create a positive ripple across the whole supply chain.

- The UK company's innovation offers solutions to challenges in the automotive, aerospace and space sector, such as:
- Automotive: components and structures have complex shapes and load paths, therefore fibre steering allows engineers to place the fibres directly on the load path of the structure. This results in a reduced amount of composite material needed and a reduced production cost.
 - Aeronautics: OEMs strive to manufacture lightweight components at high production rates. This isn't always feasible with existing manufacturing processes. RTS reduces the weight of composite structures used in aircraft, also reducing the layers of composite material needed and enabling faster production at reduced cost.
 - Space: structures are subjected to extreme environments. RTS expands design capability by enabling the alteration of the fibre orientation. This allows rapid product development cycles and higher performance.

Technical specification or expertise sought

Stage of development

Already on the market

IPR Status

IPR granted

Sustainable Development goals

- **Goal 9: Industry, Innovation and Infrastructure**

Partner Sought

Expected role of the partner

The UK company's target market is the lightweight composite market spanning from aerospace, space, automotive and wind energy. They have already collaborated in numerous grant funded projects with the likes of BAE, Airbus, JLR, and Nissan, whilst have also secured private contracts with BAE, Williams, Joby Aviation, Hyundai and they are currently in



discussions with other major players.

The UK company is looking to work with OEM, Tier1 in automotive, aerospace or space sectors and supply chains that are manufacturing composite parts, under commercial partnerships with technical assistance.

They are also looking for partners interested in exploring the potential to develop collaborative research & development proposals or commercial opportunities from their RTS technology.

Ideal partners would be composite material suppliers with a thorough knowledge on material behaviour for advanced composite applications i.e., aerospace, automotive, space and wind energy. This would develop a nascent supply chain for the next generation of high-performance fibre steered composite structures.

The partner should focus on supplying appropriate materials for each application as well as they should be able to consult the UK company's on which material would be the optimal choice for each application.

Type of partnership

Research and development cooperation agreement

Commercial agreement with technical assistance

Type and size of the partner

• **SME 11-49**

• **SME 50 - 249**

• **Big company**

Dissemination

Technology keywords

- **02007005 - Composite materials**
- **02007019 - Lightweight materials**
- **02007009 - Materials Handling Technology (solids, fluids, gases)**

Targeted countries

- **World**

Market keywords

- **09001006 - Airfield and other transportation services**
- **09001007 - Other transportation**
- **09001001 - Airlines**
- **09001005 - Motor vehicles, transportation equipment and parts**

Sector groups involved