

# [News story: UK creates world's first 3D winder for complex carbon fibre parts](#)

Specialist machinery manufacturer [Cygnet Texkimp](#) and the [University of Manchester](#) have created a cutting-edge machine to support the next generation of fuel-efficient cars and aeroplanes.

The 3D Winder is the world's first robotic winding machine capable of laying carbon fibre to make complex, lightweight composite parts for industry.

It comes out of a 2-year Knowledge Transfer Partnership (KTP).

Luke Vardy, Managing Director of Cygnet Texkimp, said:

The 3D Winder revolutionises what the composites industry can achieve with winding. It offers benefits in terms of cost and speed of manufacture as well as the strength, uniformity and repeatability of the finished product.

There is nothing else like it on the market at the moment. It is the first machine of its kind.

## **Turning research into reality**

The 3D Winder builds on a prototype from the university's [School of Materials](#).

Through the KTP, the Northwich-based company brought in PhD graduate and composites academic, Dr Yan Liu, to develop this technology to work with more complex and curved shapes.

The resulting machine uses a technique called filament winding to create complex components such as fuel pipes and aircraft wing spars, which are the main structural members of the wing.

It does so cost-effectively, in high volumes and at high speeds. Trials have shown it to produce parts much quicker and to a higher integrity than traditional methods such as braiding and weaving. It has the potential to wind an aircraft wing spar in just a few minutes.

[Cygnet Texkimp](#)

Reflecting on the KTP, Luke said:

Partnering with the university enabled us to carry out extensive

research into advanced filament winding techniques.

It laid the groundwork for us to develop a new filament winding product stream more quickly than we otherwise would, to be first to market with an innovative new product.

Following the success of the partnership, Yan was offered a permanent role at Cygnet Textkimp's R&D centre.

## **The future is bright**

Since the project ended, the 3D Winder has gone on to be recognised by industry. In 2017 it won the [Composites UK Trade Association's](#) innovation in composite manufacture award.

A production-scale version of the machine is now being used to carry out advanced trials with international part manufacturers, including one of the world's leading automotive wheel manufacturers. The very lightweight quality of composite components make the 3D Winder ideal for the aerospace and automotive sectors.

Luke continued:

We're on the threshold of a new generation of lightweight, fuel-efficient cars and aeroplanes. Demand for greater fuel efficiency and lower emissions is driving the need for better ways of producing and using intelligent materials such as carbon fibre composites.

Our long-term objective is to see this technology adopted as a conventional way to produce composite parts throughout the world.