

# 2017

## Innovation in Manufacture | **Winner: Cygnet Texkimp**

World's first 3D winding machine capable of making complex composite parts with three dimensional non-linear axes and varying cross-sections.

### Overview

The 3D Winder is the world's first robotic 3D winding machine capable of making complex composite parts with three dimensional non-linear axes and varying cross-sections.

The technology has been developed by Cygnet Texkimp as part of the company's KTP (Knowledge Transfer Partnership) project with specialists from the University of Manchester. It is based on 9-Axis robotic winding concept.

The 3D winder can quickly and precisely lay down multiple carbon fibre tows. It can also accurately follow complex curves and corners and is free from the limitation of complex cross sections of the mandrel. It is designed to lay down high volumes of fibre at much higher deposition rates than similar technologies such as braiding and weaving. Multiple tows of up to 50,000 filaments each can be laid down at once and trials have shown it has the potential to wind an aircraft spar in a few minutes.

The technology has clear value to add to the high-volume mainstream market to produce composite parts much more cost effectively and quickly, and allow them to replace steel components, which are relatively heavy for a given strength, with lighter and therefore more fuel-efficient composite parts. It enables the company to speed up composite production to a rate at which it can compete with traditional metal forming technology, and allows fastenings such as screw threads to be wound into the component without impacting on strength, making the finished part more useful.

### Credited Partners

Northwest Composites Centre, University of Manchester  
[www.materials.manchester.ac.uk/our-research/research-centres/nwcc](http://www.materials.manchester.ac.uk/our-research/research-centres/nwcc)



The team at Cygnet Texkimp receiving their award from Helen Corney, Axillium.

*"This award holds great significance for us and our partners at the University of Manchester, because it not only recognises the work of UK organisations developing truly innovative technology for the global market, but also our commitment to supporting, developing and employing a new generation of engineering talent."*

**Luke Vardy, Managing Director,  
Cygnet Texkimp**

The Composites UK Industry Awards are presented at the black-tie dinner which is aligned with the Composites Engineering Show in Birmingham.

Keep an eye out for our annual nomination process every May for your chance to apply.

[www.compositesuk.co.uk/awardsdinner](http://www.compositesuk.co.uk/awardsdinner)