Coventry, May 31, 2017. Composite materials have become commonplace in a number of industries and have become the mainstay of component manufacture in many aerospace, defence, automotive, marine and consumer applications.

Manufacturing large and complex three-dimensional components from composites however is often a time consuming and sometimes prohibitively costly process. As for other, more traditional manufacturing methods, automation could hold the key to cost-effective production of large composite components. The AT TOM Project (Affordable Tidal Turbines via Optimised Manufacture), just one of 17 integrated capability projects being delivered by The Composites Innovation Cluster under the Advanced Manufacturing Supply Chain Initiative (AMSCI), is supported by a number of technology partners, including Güdel UK.

Led by Cytec Solvay group, the AT TOM project set out to investigate the potential for automation or improved materials handling methods as a route to cost reduction. Also investigated under the initiative were factors that may affect production line layout and the possible solutions to specific quality control problems. AT TOM will ultimately contribute to developing a UK-based supply chain that can produce Tidal Turbine Blades with an improved design and up to a 30% labour saving through the use of automated handling and storage techniques.

Cytec Solvay group, tidal turbine blade manufacturers AEL Airborne, project partners and equipment suppliers As-syst Bullmer and Gudel UK have now fully implemented and commissioned an integrated material preparation, handling and storage cell within Cytec Solvay Group’s application centre in Heanor.

Güdel gantry robot helps turn the tide on costs

Innovation for the composite manufacturing
The 10.0 m long Güdel Cartesian overhead gantry has demonstrated the repeatability and accuracy for which they have become renowned, dynamically picking the ply geometries from the XY cutting system. The sophisticated end-effector, developed specifically for the application and mounted directly to the Güdel gantry, has proven to be 100% reliable in the collection, transfer and deposition of differing complexity ply geometry, some of which are up to 7.0 m in length, within a fully automated storage system. The end effector is capable of rolling the 7.0 m long ply pieces and also flat-picking the smaller ply geometries.

The next stage in the project involves using nesting algorithms to ensure plies are cut efficiently to maximise the utilisation of material, and stored by the Güdel gantry robot in the ply deposition order, therefore reducing or eliminating the average of over 23 hours of manual handling/sorting of plies currently required. Once this is achieved, it will mark the conclusion of this particular collaborative project. However, there is strong potential for transferring this technology to other industries, such as aerospace and marine, where large composite components are being manufactured.

Güdel’s expertise within the composites manufacturing sector also extends across a number of different application areas, including laying up composite...