

# 2018

## Innovation in Manufacture | **Winner: Rockwood Composites**

Pre-preg/polyimide system for cryogenic and nuclear applications

### Overview

Rockwood Composites have developed a high voltage (HV), high stress, electrical insulation system for cryogenic applications using high pressure moulding (HPM) of pre-preg composite and polyimide film.

The technology has significantly contributed to the ST40, the first world-class tokamak controlled fusion device to have been designed, built and operated by a private venture. It has shown that fusion temperatures – 100 million degrees Celsius – are possible in compact, cost-effective devices.

Components on the ST40 magnet were insulated with glass fibre and epoxy resin using vacuum pressure impregnation (VPI), a process which has been used for many years in many high voltage motors and generators. However the complexity and tight gaps within the central column make the process a high risk strategy. The use of glass pre-preg and Kapton provides a significant improvement in electrical insulation performance at a fraction of the space needed to implement VPI. Additionally the pre-preg solution can be implemented in stages allowing quality control checks to be undertaken at every stage in the process. Tokamak Energy Ltd took the bold step to break with tradition and apply a new insulation concept to a critical component when under time and cost constraints.

The market potential for Rockwood's application of pre-preg/polyimide insulation is extremely large particularly where the limitations of Vacuum Pressure Impregnation (VPI) become major road blocks in fusion technology or indeed any other technology.

### Credited Partners

#### **Tokamak Energy Ltd**

Tokamak Energy are developing a scalable fusion solution that will give the world an attractive new base-load power source that is plentiful, safe, cost effective, secure and clean.



Rockwood's Mark Crouchen (left) collects their award from Will Searle of Axillium,

"What a fantastic achievement for the whole Rockwood team. After attending the dinner and being surrounded by experts in our industry, I feel very honoured to have been recognised and rewarded for all our hard work."

**Mark Crouchen, Managing Director,  
Rockwood Composites**

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)