

2018

Innovation in Composite Design | **Winner: TWI Limited**

SurFlow: future composite data highways.

Overview

SurFlow™ enables secure transmission of data through composite structures using electromagnetic surface waves without the use of any wiring harness or fibre optics. The innovation has been to match the properties of the composite fibres, matrix and the stacking sequence to the signal transmission frequency in such a way to enable the composite structure to become the medium for surface wave propagation, without affecting the composite performance. TWI has been granted the UK (GB2522344B) and US (US10090715B2) patents, while the European patent is pending.

There is no direct competitive product on the market. The closest technology is embedded fibre optics. However, the embedding of fibre optics increases the structural weight and complexity of the composite lay-up, and embedded fibre optics cause stress concentration in the composite due to the large diameter of the fibres. If multiple data transmission paths are required, then adding many optical fibres becomes unfeasible and detrimental to the structural performance. By contrast, data transmission and multi-channelling is straightforward with SurFlow™ and does not affect the structural performance of the composite, as the signal propagates over the surface of the composite itself.

SurFlow™ can be used in any composite structure where there is a need for data transmission, whether is it information, live video feed or control signals. Hence, it can be used in aircraft, cars, trains, ships, building and even in oil and gas composite risers. For example, it can be used in aircraft to reduce the wiring harness by at least 20% and thus reduce fuel consumption. Due to this versatility, SurFlow™ can be described as the 'Future composite data highways'.



Future
composite
data highways surflow@twi.co.uk



www.twi-global.com



Jeremy Whittingham, part of the organisational team for the Advanced Engineering Show (left), presents Dr. Jasmin Stein with the award.

"I am delighted to receive the Innovation in Composite design award on behalf of the team at TWI. It is an honour to be recognised by Composites UK trade association."

Dr. Jasmin Stein, Senior Project Leader, TWI Ltd.

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