



Mark Turk

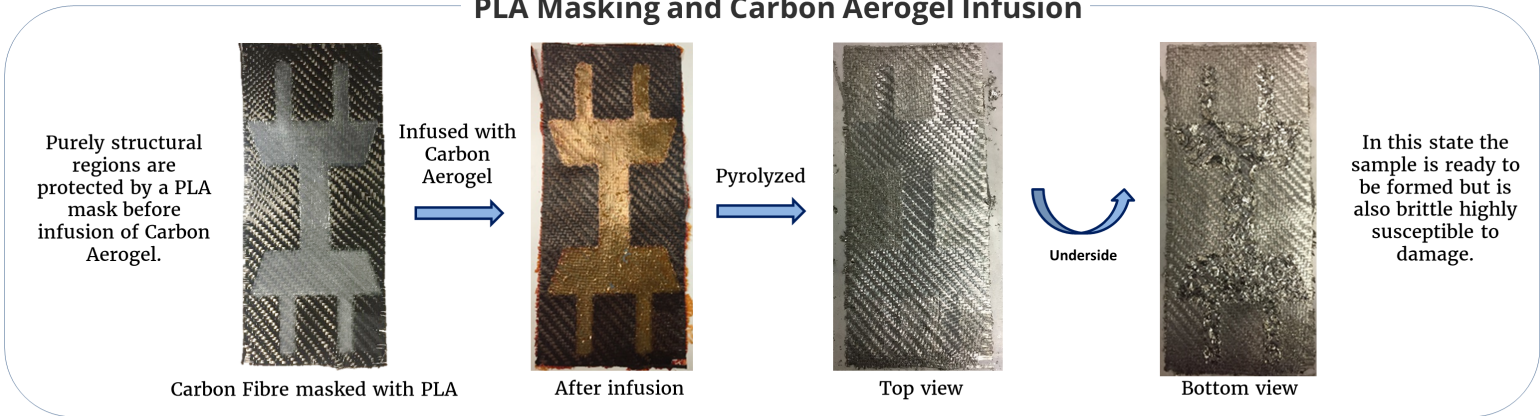
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Aims / Objectives

The idea of storing electricity in structural composites is becoming increasingly popular. The weight of batteries or supercapacitors can be substantially reduced if their functions are passed to load carrying structures. The use of porous aerogels, pursued in Imperial College London, allows for the incorporation of storage functions in the composite laminates to create structural supercapacitors.

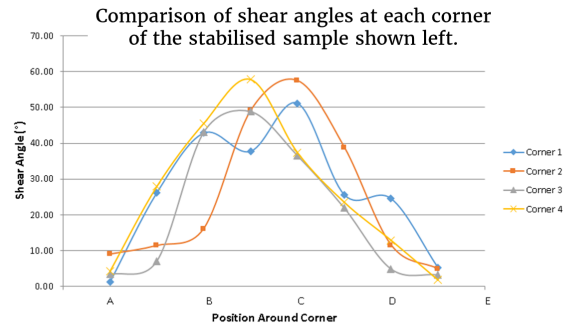
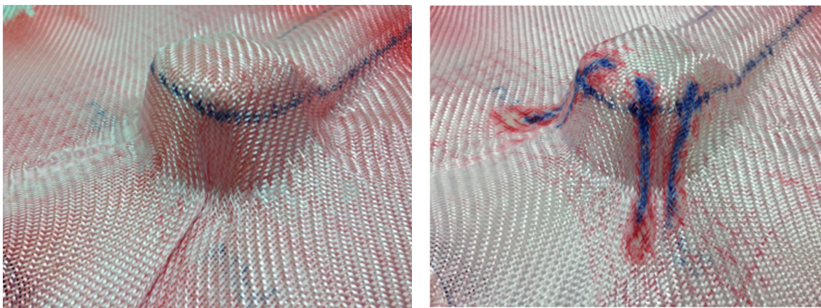
Aerogels are stiff and brittle which presents a challenge for manufacturing of complex components. This project tackles the problem of supercapacitor composites formability. Incorporation of internal impermeable barriers and stabilising elements enhance formability and aim at creating a hybrid multi-matrix structure where high shear regions remain purely structural while energy storage functions are applied in appropriate areas.

PLA Masking and Carbon Aerogel Infusion



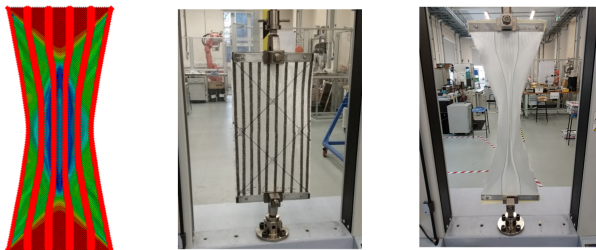
Formability Manufacturing Trials

Resin patches are placed on dry fabric to enhance the formability of high shear zones and prevent wrinkling. These are intended to stabilize the fabric in critical zones whilst avoiding excessive bending resistance.



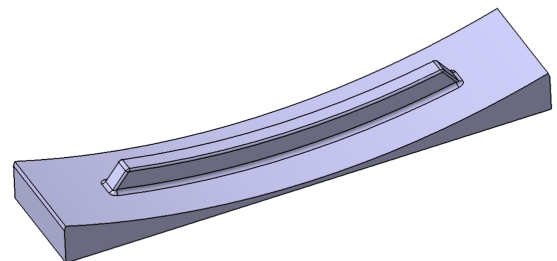
Patch Characterisation

The resin properties are identified through the use of an adapted bias-extension test. This is a new approach, the accuracy of which is currently being assessed.



Multi-Matrix Formability Demonstrator

A large scale demonstrator is in production to show the practical application of a multi matrix system.



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