NOVEL WEAVING MACHINE FOR 3D COMPOSITES

BACKGROUND

Recent development of carbon airframes (e.g. Boeing Dreamliner & Airbus A350XWB) have stimulated the growth of structural composites industry and carbon fibre consumption is likely to reach a million tonnes/pa in the next 10 to 15 years from the current level of £40,000 tonnes/pa. Current prepreg + autoclave manufacturing technology cannot cope with this rapid growing market and as a result a number of alternative low cost manufacturing techniques are under development. University of Manchester have developed a bespoke 3D weaving process that can overcome the limitations of current 3D weaving technology and address the needs of growing textile performing and 3D weaving markets.

TECHNOLOGY

Bespoke 3D Weaving technology developed by Manchester University has significantly wider applications in comparison to the commercially available 3D weaving. This technology will enable a) production of thick preforms b) preforms with steps or taper c) preforms incorporating off-axis fibres.

KEY BENEFITS

- Less fibre damage during weaving and better damage tolerant woven structures
- Preforms significantly thicker than currently possible
- Complex weave structures to enable introduction of pockets and folds in order to produce 'origami' like 3D shapes
- Significant time saving in comparison to hand lay-up

APPLICATIONS

- Aerospace: Fittings, fuselage frames, stringers for wings, landing gear and aeroengine parts
- Automotive: Fittings, chassis components, suspension links, crash components
- Wind turbine: Capping strips, stringers for turbine blades
- Engineering: Robotic grippers, fittings, high speed machinery components

CURRENT STATUS

Prototype machine has been developed to demonstrate the technology and a full-scale machine is currently under development.

CONTACT

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