



Mike Maddock of PES, Roland Krain of Teks, Dan Fleetcroft of PES and Tim Swait of AMRC with a biocomposite part cured in the AMRC Composite Centre's oven.

Bringing new materials to market

Performance Engineered Solutions Ltd (PES) is bringing innovative biocomposite materials for high-performance vehicles to market in partnership with the AMRC with Boeing.

Engineering design business PES is playing a leading role in developing sustainable alternatives to the carbon fibre and epoxy materials used in conventional composite materials. These materials are energy-intensive to manufacture, and are not easily recyclable or biodegradable at the end of their lives.

Replacing some or all of these raw materials with sustainable carbon-neutral alternatives can significantly improve the environmental performance of composites manufacturing, and has the potential to revolutionise the production of specialist components for niche vehicles.

PES worked with the AMRC Composite Centre as part of a project called Elcomap (Environmentally friendly lightweight composite materials for aerodynamic body panels). The project is part-funded by the Niche Vehicle Network, an industry group for specialist UK vehicle manufacturers backed by the Technology Strategy Board. Teks UK, a technology development business based on the Advanced Manufacturing Park, is also a partner in the project.

PES and Teks produced a series of car panels – two Porsche rear panels and a larger Subaru front end – from biocomposites based on flax fibres and

resin from cashew nut shells.

“Biocomposite panels in the past have been flat facia panels, but we’ve used some complex geometry to really push the boundaries of what we can achieve,” says Mike Maddock, PES Managing Director. *“We’re looking at the boundaries to find new technologies, to potentially license them, and be the leader in our field.”*

The companies used the clean room, large oven and autoclave in the AMRC Composite Centre to produce the prototype parts, and also drew on the expertise of the research group. *“Our expertise in the processing and manufacturing of parts using biocomposite materials was vital for the project,”* says Tim Swait, AMRC Research Engineer.

“For a company of our size, it’d be very difficult to pull all the resources together in one environment to make it viable to carry out this kind of research

project,” says Dan Fleetcroft, Engineering Design Director at PES. *“To drive new technologies and innovation into the market takes collaboration, knowledge and investment.”*

“The AMRC is at the forefront of developing new manufacturing technologies, so we become aware of them more readily than through trying to read all the journals and research papers.”

PES has also been active in the AMRC’s business networking activities, including presenting its innovative technologies at the AMRC Forum. *“Those events bring like-minded businesses together, and have led to many new enquiries for us,”* Maddock says.

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