

INNOVATION IN DESIGN

Shortlisted: Jaguar Land Rover

TUCANA - An APC funded project focussed on lightweighting with composites for mass production vehicles

The APC funded project TUCANA is an enabler for future generations of Battery Electric Vehicles (BEV), demonstrated through the redesign of the rear structure of a Jaguar I-Pace, the acclaimed Jaguar Land Rover (JLR) BEV.

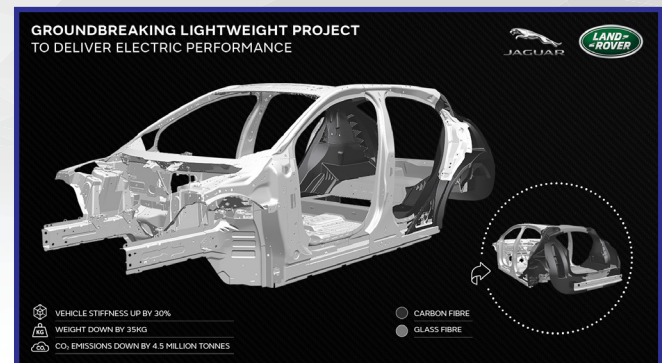
Unlike traditional fabric-based components using RTM or autoclave technology, which are not viable for a high volume (40,000+ unit per annum) cycle time nor a business case point of view, TUCANA focused on optimising the use and location of material.

To achieve this, a topology optimisation helped define the major load-path hence creating the skeleton of the structure where fast-cure carbon or glass uni directional (UD) fibres were laid.

To put flesh around this skeleton and connect the UD together Sheet Moulding Compound (SMC) was used for its low cost, fast cycle time and high design freedom, capable of achieving complex 3D shape and convoluted design features.

Combining UD and SMC reduced the part count by 63% but was a manufacturing challenge especially in term of UD retention, adhesion or warpage management. The compliance of the TUCANA structure with the traditional paint process and temperatures up to 200°C was the critical challenge of the project.

Website: www.jaguarlandrover.com



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