Advanced Composites Group
umeco composites

Case Study

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Automotive Sector

Door Modules

Objectives

To develop and manufacture structural carbon composite door assemblies using high volume/low investment composite processing.

Application Development

Cost effective carbon composite applications manufactured in high production volumes require low cycle time processes. The door modules on the Porsche Carrera GT are compression moulded by CarboTech Composites GmbH (Salzburg, Austria) using ACG MTM® prepreg systems.

The design of door modules in traditional thermoplastic materials suffers from compromises of package space and structural function. The non-homogeneous nature of continuous fibre composites however - specific fibre positioning and orientation - can be exploited to optimise the structure within the restrictive package envelope. The load path is analysed using industry standard CAE techniques that have been adapted and applied to composite materials. Fibre choice and position is defined to address the specific structural and commercial requirements. This approach results in fully optimised structures.

The resin and fibre types, their orientation and position are tailored to develop the optimised material lay-up for the compression moulding process. The material formats are then defined and delivered to the moulder either in rolls or cut kits.

Producing the parts from low investment tooling using low pressure matched die compression moulding processing offers additional benefits of higher quality, repeatability, and defined A and B surface positions that are not possible with single sided oven or autoclave cured processes. The components can be designed to integrate additional functionality from local hard point reinforcements through to moulded-in holes to minimise the expense of secondary operations.

All composite application development requires a detailed Design-for-Manufacture approach to get the fully affordable optimised structure.

ACG offers project-managed turn-key solutions that cover full engineering support from initial concept through prototype development to a production ready process that the OEM or Tier 1 can then place at their preferred moulder.

Images courtesy of Porsche

Within this, ACG provides some or all of: Composite design and analysis from concept to production, including CAE support, Prototype parts, Full design-for-manufacture studies, Prototype and production tooling design and sourcing, Full material specification definition and lay-up documentation, Production process optimisation, documentation and production support at the Tier 1 or nominated moulder/s.

CARBO Composites TECH

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