

# Automotive Sector

## Structural Bulkhead

### Objectives

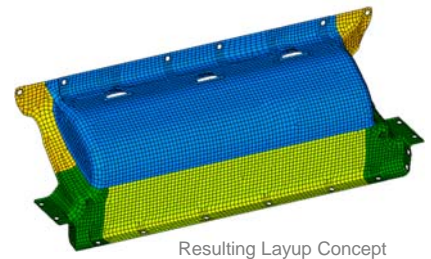
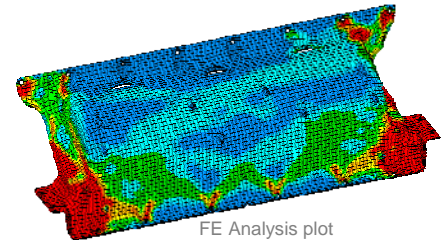
As part of the continual drive for better fuel economy and lower emissions, ACG was tasked by one of the largest European OEMs to produce a detailed feasibility study on a structural bulkhead to show that composite structures were both technically and commercially feasible for production volumes up to 30,000 parts per year.

### Concept Development

The OEM set aggressive technical targets focusing on significant weight reduction and increased performance, all for a comparable piece price.

Material specification and correlated performance simulation is key to the rapid composite engineering solution and essential for the OEMs. Material, the choice of manufacturing process, design-for-manufacture and the use of automation where necessary in the manufacturing process, are key for controlling the costs.

Employing ACG's extensive material portfolio and volume processing experience combined with Penso Engineering's computer modelling and vehicle engineering experience, the design was optimised iteratively. A turn-key design and processing solution was developed, refined and presented by ACG's automotive engineering team only a few weeks later.



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.

The final solution offered significant mass reduction. Both torsional stiffness and NVH damping characteristics were also significantly improved. With the adoption of suitable automation during the manufacture process, equivalent part price could also be maintained. With ACG having shown that the technical and commercial targets could be achieved, the OEM is currently considering its next steps.

### Results

- Mass reduction of 50%.
- Stiffness increase by 50%.
- Equivalent piece price using automation.
- Low cost prototype and production tooling.
- Increased stiffness requires few fixings.

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