



COMPOSITE STRUCTURAL DESIGN & DEVELOPMENT

SUPPORTING AIRFRAME, INTERIORS AND ENGINE INTAKE
DESIGN, FROM CONCEPT TO CERTIFICATION

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CAPABILITY STATEMENT

STRUCTURAL DESIGN & CERTIFICATION

- Design development of composite structural components or assemblies, offering advice on composite systems, effective usage, manufacturing options and integration with interfacing new or legacy metallic elements
- Provide advice on the appropriate analyses, testing & structural optimisation
- Design definition of geometry, materials, lay-ups, discontinuities, drop-offs & draping
- Monolithic Carbon, Glass, Kevlar or Boron in numerous epoxy resin systems
- Honeycomb panels with Nomex or Aluminium cores
- Structural Damage Assessment, such as Delamination, Water ingress, BVID
- Electrical continuity inclusion
- PEEK analysis & assessment
- Repair Scenarios
- Impact/Bird strike assessment of composite structures
- Thermal environment and metallic interaction analysis

MANUFACTURING TECHNIQUES

- Development of component manufacturing process
- Autoclave cure temperatures and cycles
- Advice on Mould development & assessment
- Cold cure system assessment
- Automatic Tape layup, manual placement or chop strand injection mould assessment



DELEGATED SIGNATORIES

- Composite Approval for A350 Fixed Trailing Edge, A400M & Boeing Wide Body Stow Bins



EXPERIENCE AT A GLANCE

- A350 Fixed Trailing Edge:
 - Led client teams during development of Inner & Outer Structural & Honeycomb Shroud panels
 - Certification of the Inner Structural, Shroud & Main Landing Gear Door panels, including all formal documentation including Airbus Stress Dossiers & Structural Repair Manuals
 - Development of FE models containing composite structures, including 3D representation of honeycomb regions
 - Impact and PRA assessments due to Tyre Burst & Wheel Rim Release
- Type 26 Frigate: Design analysis, sizing and integration for Composite Sandwich Panel Mast superstructure and Shaft Bracket Fairings
- Pall Aerospace: Helicopter Engine Air filters and Intake door Design & Certification analysis, including bird strike
- A350 Rear Fuselage: metallic to composite joint Certification analysis
- Pilatus PC-24: Certification static analysis including engine pylon composite panels
- A320 CPD: conducted investigation into optimised composite re-design of existing metallic belly fairing in order to reduce weight

SOFTWARE & ANALYSIS TECHNIQUES

- Development of Analysis Techniques in conjunction with clients
- Analysis and calculations for all the principal failure modes of composite structures: including joints, strength, buckling and sandwich region wrinkling or core shear
- From Classical Laminate Theory to tools such as Airbus bespoke ISAMI software
- Design Development using CATIA V5 or SolidWorks

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COMPOSITES CAPABILITY STATEMENT



CASCADE
ENGINEERING

DEPENDABLE ENGINEERING,
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