Capabilities

FGS Composites specialises in fibre composites processing and metal fabrication. With over 20 years of industry experience, FGS has adopted innovative manufacturing methods to overcome challenging design, production and maintenance projects. Manufacturing capabilities include:

Mechanical and architectural design concept development – we are experienced in the generation, evaluation and selection of design solutions.

3D CAD design along with FEA and (when required) **2D engineering drawings** using: Solidworks, Inventor and AutoCAD software. This is useful for visualisation, simulation or animation of the design before it is built. It helps you understand and market the design, helps us eliminate errors and is useful for transmitting design data to subcontractors, e.g. CNC machine shops.

Engineering calculations are performed and documented using software, which simplifies verification by clients and third parties. Results can be instantly and accurately recalculated when any changes are made.

Finite Element Analysis using FEA to solve a wide range of problems, from simple linear statics to complex nonlinear contact, buckling, dynamics, and heat transfer analyses with simple or sophisticated material models.

Prototype & Production using hand lay up, spray up, vacuum bag consolidation, resin infusion and vacuum assisted resin transfer moulding are just some of our systems used.

Infrastructure/equipment
⇨ Vacuum pumps for vacuum assisted resin transfer moulding, resin infusion, vacuum bagging, vacuum mixing and vacuum casting
⇨ Composites fabrication equipment
⇨ Resin glass depositor, infusion equipment
⇨ Welding with MIG, TIG and Stick
⇨ Lathe, Mill, Punch and Shear, NC Press Brake and Guillotine, Horizontal Bandsaw, Drill Press, Pedestal Grinder, Workshop Tools
⇨ Instrumentation: thermocouples, pressure transducers, load cells, data acquisition card
⇨ Hardness and toughness measuring machines
⇨ Access to mechanical, materials and chemical testing laboratories, e.g. Instron load testing machines, MTS fatigue testing machines, Pyrolysis Gas-Chromatography Mass-Spectrometry (Py-GC-MS), Differential Scanning Calorimetry (DSC), thermal gravimetric analysis (TGA) etc.
⇨ Access to research libraries and online research publications

Software
⇨ Access to SolidWorks, INVENTOR AND AUTOCAD, Rhino for 3D solid modeling, 2D engineering drawings, animations, visualisation and basic finite element analyses
⇨ Access to FEA for complex finite element analyses such as nonlinear contact, buckling, dynamics, and heat transfer analyses with simple or sophisticated material models

Processes
⇨ Contact moulding/hand lamination, vacuum bagging, resin infusion, vacuum assisted resin transfer moulding, pressure moulding
⇨ Thermoplastic welding

Skills and qualification
⇨ Staff with Composite Technician Level 3 trade qualifications and above.
⇨ Staff with qualifications in mechanical engineering.