



Composites Production Capabilities

We deliver tailored composite solutions to meet our customers' specific requirements, however bespoke, complex or challenging. From composite design, prototyping, manufacture and in-service support to test and certification, we do it all, end-to-end, start to finish. There are few companies in our industry that have the breadth of capabilities to compare with Marshall Aerospace and Defence Group. Each of our processes is industry-standard, but it's how we integrate them that is industry-leading.

Approvals; Company		
Approvals; Regulatory	Afnor Afnor	AS9100 Rev.D ISO9001:2015
Additive Manufacture	3D Printer	Fortus 450MC with carbon capability
Assembly	Complex IPC620 / mechanical assembly* Bonding (Heat cured & room temperature)	MK D1500 Electrical Test Unit
Autoclaves	Autoclave 1 Autoclave 2 Autoclave 3	2.1m Diameter x 15.2m Long. 200°C and 7 Bar Max 2.5m Diameter x 4.2m Long. 200°C and 7 Bar Max 750mm Diameter x 700mm. 200°C and 8 Bar Max
Clean Rooms	Clean Room (2 off)	ISO 14644-1:2015 ISO Class 8
Inspection	NDT - Woodpecker NDT Scanning 3D Scan Faro Arm Wentzel Coordinate Measuring Machine (CMM) Sokkia Total Measurement System Olympus portable ultrasonic thickness measurement	C Scan unit is a wheel Probe 2 3 x A Scan units *We have the capability to do Bond Testing and have used FPHASEDARR to provide A, B & C Scan Capability 16.6m³ 3m Arm 750mm x 750mm Optical measuring system
Testing	Instron 5969 Materials test Machine Enviromental Chamber Triton Technologies TTDMA Dynamic Materials Analysis Machine Perkin Elmer Pyris DCS 6 Ancillary Equipment	2 x Load Cells, 10Kn & 50Kn capacity 350 °C max Tension, Flexural, Short & Long Beam and Compression Testing
Machining	5 axis CNC Digital Lathe 1 Digital Lathe 2 Milling Sheet Bender	CNC Machine is a CMS Antaris with a 2.5m x 1.6m Bed Size 5m x 860mm Diameter Harrison 700mm x 400mm Digital Milling Machine Booster metal bender and cutter

Materials	Carbon / E-Glass / S2-Glass Kevlar/Dyneema/Innegra Fabrics Hybrid Metallic and Composite materials	Both woven and unidirectional
Ovens	Ovens (5 off)	Maximum size PLO16 - 360 degree Box Oven (3.8m x 3.5m) PL290 - Oven (3.5m x 7.9m) PL141 - Oven (1.8m x 2.4m) PLO64 - Oven (1m x 0.5m) PL123 - Oven (10m x 5m)
Simulation	CATIA CPD	CATIA v5
Surface Treatments	Spraybake Paint facility Spray Booth Paint facility Spray Booth Ovens (4 off) Shot Blasting 1 Shot Blasting 2	2 No. Junair Vehicle Spraybooth Ovens with QADS - EVAC 1 No. Junair Vehicle Spraybooth Oven - Chest Extraction 1 No. Junair Preparation Booth 1 No. Paint Mixing Room 1 No. Dust Extraction System 900mm x 750mm 1400mm x 1500mm
Techniques	Pre-preg Lay Up Resin Infusion Resin Transfer Molding (RTM) Filament Winding Wet Lay-Up Glass/Carbon Roving Pultrusion Laser Ply Placement Cloth Cutting Machine Heatcon Portable Curing	Epoxy, Phenoli, Cyanate Ester Laminates Structures up to 5m x 6.5m Long. Up to 3000kg structure. TBD, Ciject machine, VARTM 4 Axis CNC 7m Long x 850mm Diameter. 4m x 8m Infra-red bed. Phenolic, Polyester, Epoxy 3 Laser projectors Zund Alphacam CNC . 3.0m X 1.5m. Environmentally controlled room.