

3DS is the composite reinforcement project being developed by M Wright & Sons Limited, technical weavers of advanced engineered textile structures. The Company have commissioned a bespoke computer controlled loom with the capability to weave innovative 3 dimensional structures. In addition our product range includes 2D reinforcement tapes and 2½ D constant section shapes.

To appreciate our manufacturing capabilities it is necessary to understand our definitions of the structures we offer.

2D reinforcement tapes have 2 dimensional fibre architecture. The reinforcement fibres lie in the X and Y direction only and the final fabric shape remains 2 dimensional.

2½ D fabrics are similarly woven flat, have 2 dimensional fibre architecture, again with the reinforcement fibres in the X and Y directions. The fabric is then opened out into a constant section shape such as T, I, π etc.

3D structures have 3 dimensional fibre architecture with reinforcing fibres in X, Y and Z directions. The final shape may be a flat tape, a constant section shape or a true near net shape 3 dimensional preform.

3D Carbon Fibre Preforms

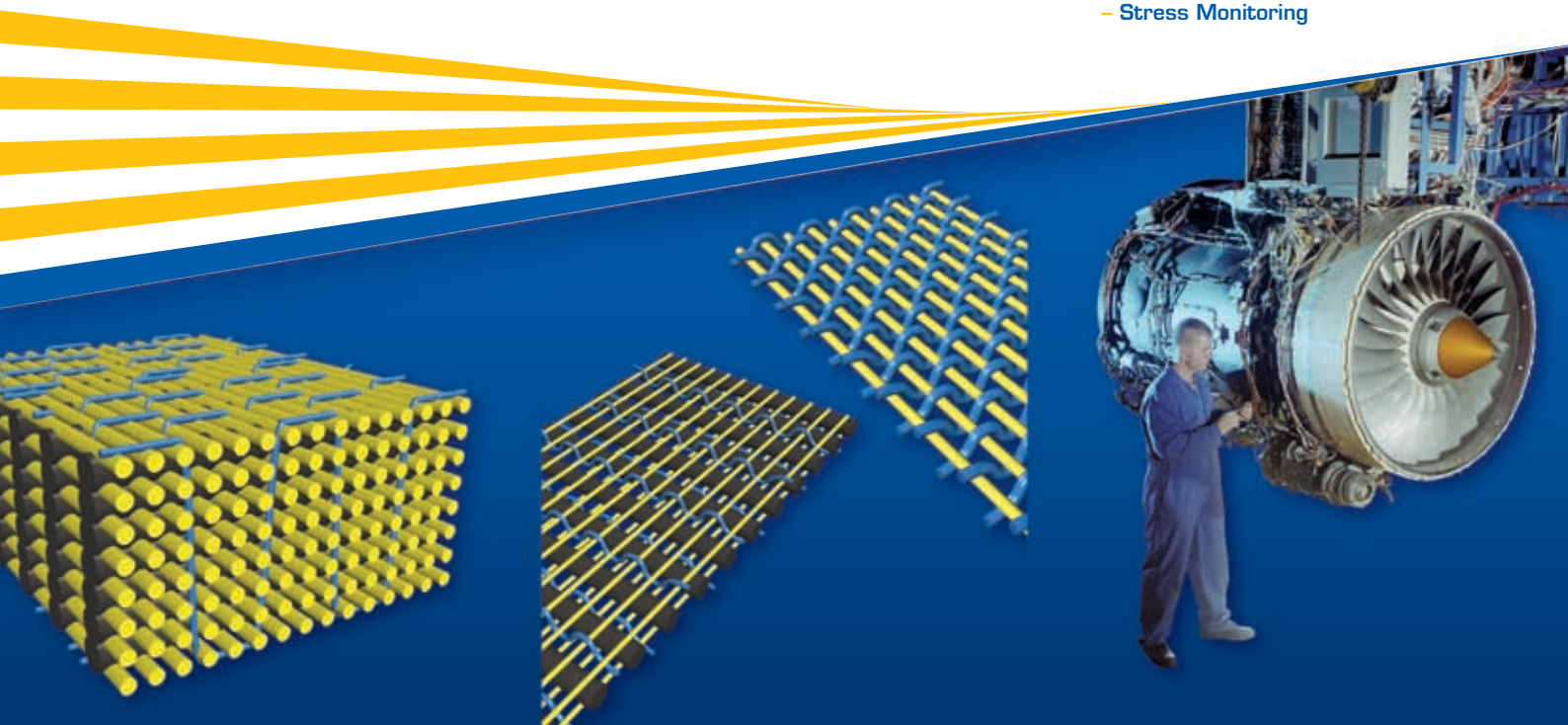
- Mould ready – net shaped preforms
- X, Y and Z axis fibres
- Bespoke structures
- Fabric weights to 7000 g/m²
- Max thickness 8mm
- Max width 300mm
- Fibre Volume Fraction (V_f) to 65%
- Precision fibre placement
- T, I, L, H, Y, π and top hat sections

2 & 2½ D Woven Narrow Fabrics

- 2D reinforcement tapes
- 2½ D constant section shapes
- True Uni and Bi directional structures
- Carbon, glass, basalt, aramid & hybrids
- Fabric weights from 160 g/m²
- Maximum width 150mm
- Non fray edges
- Woven tubes
- T, I, L, H, Y, π and top hat sections

Engineered Aerospace Textile Structures

- AS9100 Quality Management System
- Kevlar® fan blade containment systems
- Suppliers to:
 - Rolls-Royce®
 - GKN Aerospace
 - Pratt & Whitney
- 3D woven carbon fibre airframe components
- 2 & 2½ D woven narrow fabrics
- Incorporated SMART applications:
 - Communications
 - Stress Monitoring

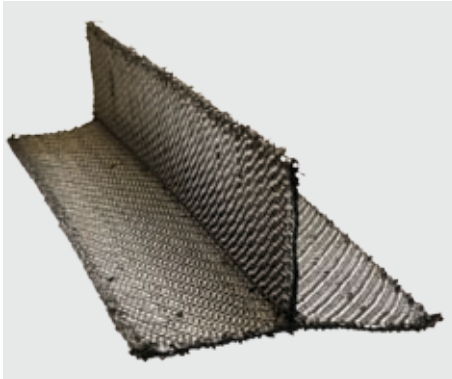


Capabilities and Equipment

M Wright & Sons have over 150 years experience in the manufacture of woven narrow fabrics, many of which incorporate performance fibres and complex fibre architecture. The design and development of a bespoke 3D loom together with accumulated technical expertise position M Wright & Sons as one of only a small number of companies able to offer advanced composite preforms for out of autoclave processing.

The cornerstone of our capabilities is the custom built loom, based on the principles of narrow fabric weaving. This operates in conjunction with the Stäubli Unival jacquard, the jacquard of choice for critical composite fabrics. Scotweave custom software enables the design of complex fibre architecture and control of precision fibre placement through the synchronised operation of loom and jacquard.

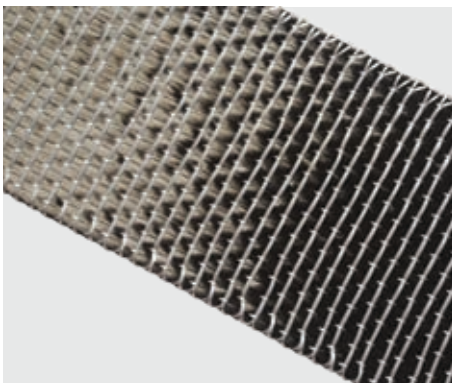
Complementing our 3D weaving capability is a range of narrow fabric needle looms dedicated to the manufacture of 2 and 2½ D reinforcements.



Product Focus – 3D Carbon Fibre T Section

Key features

- Multi layer fibre architecture with Z direction fibre reinforcement on both blade and flange
- Integral noodle reinforcement
- Edge lock system to give sealed edges for no-trim straight to mould capability
- Fully computer controlled for absolute repeatability of structures
- Continuous section lengths available



Product Focus – True Uni Directional Carbon Fibre Tape

Key features

- Warp yarns are 'dead woven' to give minimal crimp (typically less than 0.1%) of UD reinforcement fibres
- UD fibres packaged by way of non reinforcing 'scaffold' weave
- Heavy weight tape capability through multi layering of UD fibres, aiding weave stability.
- The featured product weighs 1400 g/m², with lower weights possible through use of finer tow counts and single layer structuring,
- High density of UD fibres