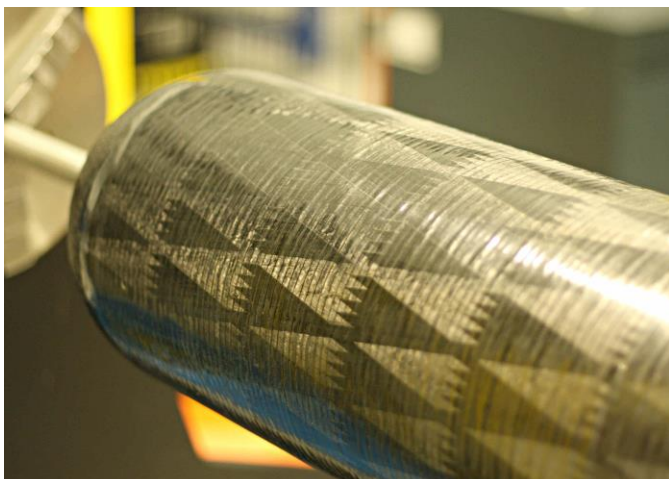


Robotic Filament Winding Capability

Machine specification (MFTech FW)

- 8 axis system (6 axis robot, plus spindle & rotating eye).
- 2 winding setups: Process 1 – Mandrel held on floor mounted spindle, Process 2 – Mandrel held & rotated by robot.
- Process 1 – Parts up to 1.2m diameter, 4m long & 2000kg.
- Process 2 – Parts up to 1m diameter, 1.2m long, limited to 90kg.
- Max spindle rotation speed 100rpm.
- Capable of winding non-axisymmetric & multi-axis parts.
- 4 tows, up to 24K or ½" wide each.
- Wet winding (up to 100°C rein heating), dry or prepreg/towpreg winding.
- Tension up to 50N (± 2 N) per tow.
- COMPOSICAD programming – pipe, vessel, axisymmetric, spar, curve & tee.



Filament winding research

Filament winding has existed as a composite manufacturing process for many decades, but the use of robotics is a more recent development, initially researched in the 1990's and commercialised by MFTech, France in the 2000's.

The use of robotics can offer more flexibility, even though the standard setup often mirrors that of a traditional CNC winder. The AMRC facility, supplied by MFTech, can operate in a traditional winding setup as well as by mounting parts on the robot and integrating pre and post winding operations into the robotic cell. Commissioned early 2013, it has been used for a wide range of composite research projects for manufacturing products such as:

- Pressure vessels.
- Electric rotor magnet retention.
- Torsion actuation shafts.
- Torsion beam suspension links.
- Propeller blades.
- Rapid preforming for RTM.
- Fuel pipes.
- Designer furniture.

