RAMPF
discover the future

RAMPF TFP Technology: Bring Unique Designs to Market Faster & Cheaper

Revolutionizing Aerospace with Tailored Fiber Placement (TFP) Technology

RAMPF Composite Solutions' TFP technology delivers unparalleled innovation in aerospace, including unmanned aerial vehicles, combining accelerated market entry, superior component performance, and unmatched design flexibility with cost-effective and complete in-house manufacturing in North America.

Challenges of Traditional Hand Layup

High material waste from excess trimming.

Limited fiber orientation hampers creation of complex, organic shapes and compromises part performance.

Processes like hand layup are labour-intensive and prone to quality inconsistencies.

Key Advantages of TFP

Material Efficiency: Precise fiber placement cuts waste to almost zero.

Design Flexibility: Complex shapes and optimized fiber orientation for enhanced structural performance and weight reduction.

Consistent Quality: Automated stitching ensures consistent quality, high production speeds, and low labour costs.

TFP by RAMPF Composite Solutions

- Mimics biostructures for enhanced strength and resilience, reduced weight and optimized performance.
- Reduces carbon fiber waste (> 95% utilization rate instead of typical 80%) for greater environmental benefits.
- Saves costs via in-house moulding, tooling, and stitching, while streamlining preform layup process.
- Highly scalable, large-scale production.

RAMPF's TFP Technology In Action: Manufacture of Ultra-Lightweight Composite Propeller

High-quality, cost-efficient, and lightweight collaboration – Downsview Aerospace Innovation & Research (DAIR) and RAMPF Composite Solutions:

Solution Highlights

- Manufacturing baseline carbon fiber propeller and subsequent innovating with TFP variant that maintains the same performance characteristics.
- Significant aerospace benefits, including reduced fuel consumption and lower stress on powertrain component for extended lifespan.
- Precise tailoring of propeller's performance features for optimal efficiency.
- Substantial reduction of material waste during manufacturing, underscoring TFP's environmental advantage.

Production Process

- Additive manufacturing process uses carbon tow stitched to lightweight carrier fabric.
- 2D Preforms stitched on flat surface are placed during lamination step into 3D mould.
- Highly automated, efficient, and scalable aerospace-grade industrial process.
- Specialized design optimization tools for best-in-class “bionic design” performance.
- Integration capabilities include antennas, wires, sensors, etc.
- Easily manages complex patterns and variable axes and thicknesses, avoiding constraints of typical woven fabrics.
- Suitable for dry fiber infusion, RTM, VARTM, and wet layup processes.

The Bottom Line: RAMPF's TFP technology

- Accelerates the development and market readiness of novel aerospace and UAV components.
- Ensures lighter, stronger, and more sustainable parts compared to traditional methods.
- Offers a scalable, customizable, and sustainable alternative that effectively bridges the supply chain gap in North America for high-quality, cost-effective parts.

Revolutionize your component design and production with RAMPF's TFP technology – where innovation meets speed, sustainability, and unmatched performance.

24-8-0006EN. Errors excepted. Subject to change.

RAMPF Composite Solutions, Inc.

5295 John Lucas Drive, Unit 5 I Burlington, Ontario, Canada L7L 6A8
P +1.905.331.8042
E composite.solutions@rampf-group.com
www.rampf-group.com