



# Automated Fiber Placement



## Additive manufacturing for advanced composite structures.

At Trelleborg Sealing Solutions, we're experts in innovating and producing high-performance composite parts. Our solutions bring additive manufacturing technology to advanced composites, creating customized parts for critical applications in demanding environments around the world.

Our proprietary Automated Fiber Placement (AFP) process is one of the most advanced methods for fabricating composite structures from thermoplastic and thermoset materials. Our robotic system places continuous-fiber composite tape one layer at a time, bonding the layers together using a heat source to build a complete structure.

AFP enables the fabrication of highly customized parts, as each layer can be placed at specified angles to best carry the required loads. The use of robotics gives us active control over all process-critical variables, making the process highly controllable and repeatable.

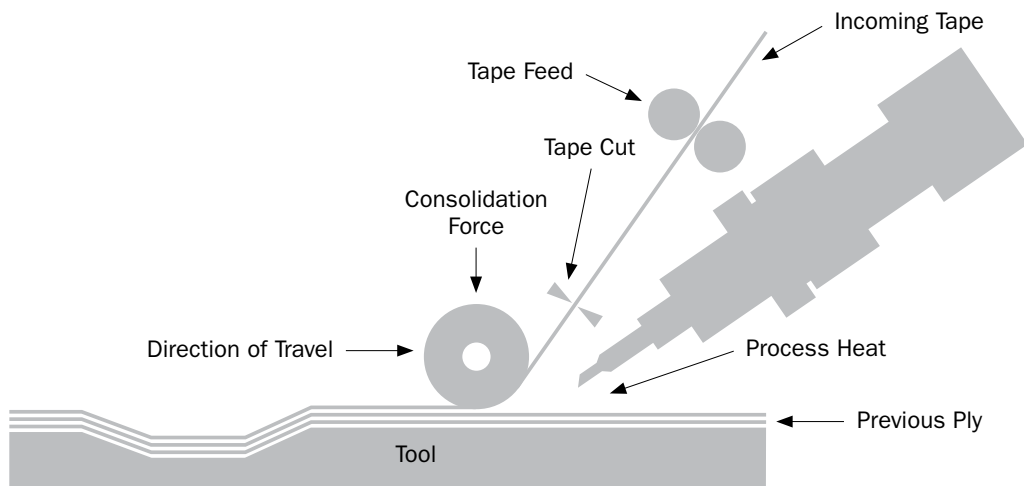
### Benefits of AFP:

- Fabrication of customized parts
- Controllable and repeatable process
- Lower material waste
- Precision placement of tape
- Compliance to complex surfaces
- Right-sized to fit customers' applications
- Increased material throughput
- Improved composite structure quality
- Quicker manufacturing time

## AUTOMATED FIBER PLACEMENT

### How It Works:

- Spools of continuous fiber reinforced prepreg tape are loaded into a creel system
  - Individual tape strips are 1/8" to 1/4" wide
- Robotic machinery lays these tows one ply (layer) at a time to build a structure
  - Each ply can be placed at different angles for highly customized parts
  - Individually controlled tapes can start and stop at different locations along the length of the band to reduce scrap, provide compliance to complex surfaces and allow precision placement of the tape
  - At the end of each band of tape, any tape in process is cut and the robot moves to the start of the next band
- Each band passes in front of a heat source (hot gas torch, laser, etc.) and under a consolidation device (roller, shoe, etc.)
  - By melting thermoplastic tape or making thermoset tape more tacky, the heat bonds the material to a substrate when it passes through the consolidation device
- The process is repeated band-by-band until each ply is complete and ply-by-ply until the final part geometry is achieved



Tape/Fiber Placement Process



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