

# Low Cost Composites for Limited Production Structures

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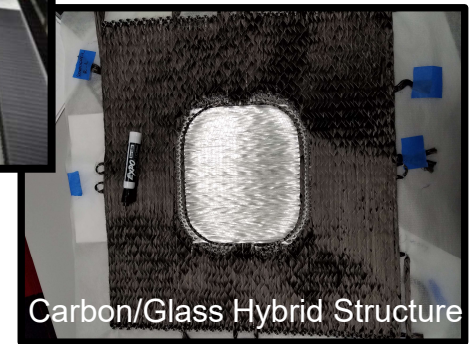
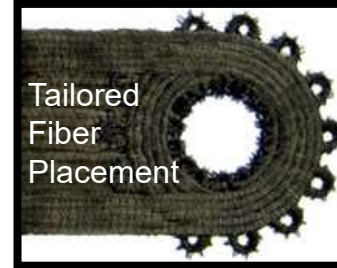
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## Affordable Composites for Low Cost Attritable Aircraft Structures



## Utilize Additive Manufacturing for Manufacture of Low Cost Tooling and Composite Preforms

- Utilize production 3D printing and weaving equipment to produce low cost, complex architecture composite structures
- 3D printed tooling uses innovative low thermal expansion polymer that matches traditional aluminum tooling.
  - Stability demonstrated in >10 autoclave cycles
- Automated Tailored Fiber Placement (TFP) places the fiber in a prescribed orientation for optimization of structural properties
- Technology Maturity: MRL 7, TRL 7

## Reduce the Fabrication Time & Cost of Limited Production Aircraft Structures by 25%

- >25% cost savings in graphite/epoxy composite structures
- 3D printed tooling saves lead time by 6-11 weeks; TFP construction increases weekly output by 3X with 1/6<sup>th</sup> the labor; both technologies proven in production
- Currently working DoD, automotive, energy and other applications. See opportunity in AAM vehicle structures and propulsion applications.
- UDRI works with a wide variety of customers and can handle most any proprietary or security requirements

Airspace  
Management ☐

Command &  
Control ☐

Comms ☐

Power &  
Energy Storage ☐

Propulsion ☒

Sensors &  
Awareness ☐

Other ☒