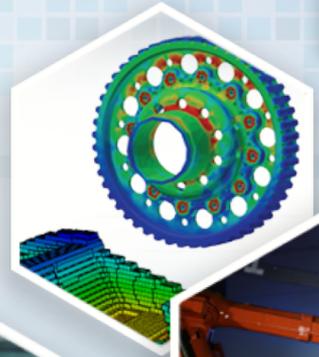


Project 6.12 – Textile Carbon Fiber Packaging and NCF Production

Kevin Ahlstrom – Project Director

26 July 2018 Summer Meeting



Project information



- ◆ Project description – develop commercially relevant packaging and payout technology for textile carbon fibers and demo its utility in non-crimp fabric production
- ◆ Length of Project – 1 year
- ◆ Partners – McCoy Machinery, Chomarar, Monte fibre, Oak Ridge National Laboratory, University of Tennessee
- ◆ Technical Knowledge/Innovation being Addressed:
 - ◆ *How to package and pay out textile carbon fibers by methods that preserve the inherent cost advantage while delivering the rate, quality, and uptime needed for industrial production of intermediates and composites.*

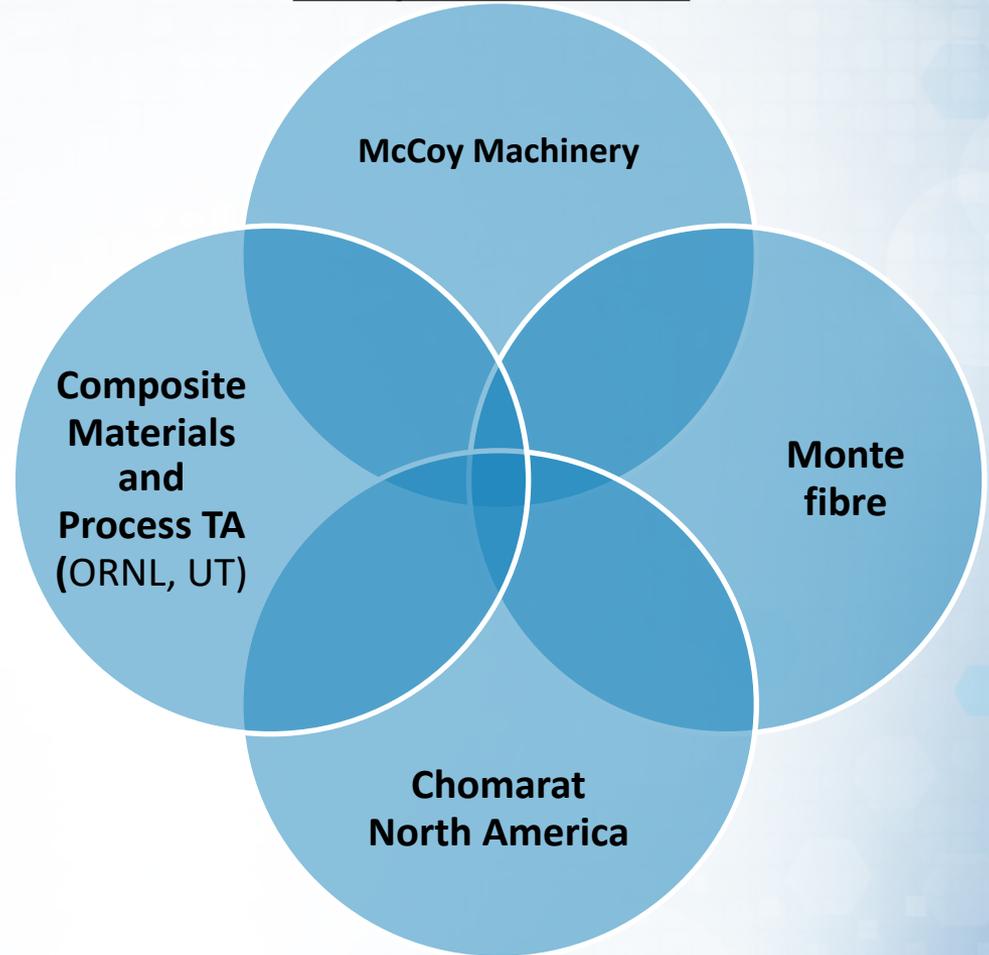
Project 6.12 Integration and Connectivity



Integration across IACMI Technology Areas:

- Composite Materials and Process TA
 - Oak Ridge National Laboratory – textile CF production, test packaging equipment at CFTF
 - University of Tennessee – test fiber payout at prototypical manufacturing facility
- Vehicles
 - Future creel payout testing at Corktown pre-preg line (in another project)

Project Team



Challenges



- ◆ Initial fiber uniformity & fiber properties
- ◆ Pre-carbonization fiber handling and fiber delivery
- ◆ Sizing application & execution
- ◆ Sizing chemistry
- ◆ Winding wide width tow (no conventional means today)
- ◆ Controlling take-up tension
- ◆ Commercialization of large scale winding machinery
- ◆ Downstream package acceptance
 - ◆ Pre-preg, NCF, Pulltrusion, etc.
- ◆ Paper infill – Yes or No

Initial Results

Lab Setup

- 1,200-1,300 grams of unrolling tension
- Standard composite creel with 76mm cardboard tube supply package
- DIN bobbin – 4"W x 12"Dia x 6" barrel
- Spreader bars - anodized aluminum & stainless steel, and adjustable
- 457K single tow
- No Paper infill on take-up



Here we go!



Initial Findings



- ◆ Wide tow fiber does not like to be traversed
- ◆ Fiber quality impacts take-up quality significantly
- ◆ Sizing chemistry could eliminate paper in-fill
- ◆ Off-the-shelf DIN bobbins are available
- ◆ Cardboard tubes are not the answer
- ◆ Spreading is required for consistent, even winding
- ◆ Coating of fixed surfaces is critical
- ◆ We anticipate an additional 25-30% increase in yardage with the introduction of a press roll system

Acknowledgements



Cliff Eberle
Dale Brosius
Ellen Cronin
Lisa Fitzpatrick
Jillian Hill
John Unser
Erin Brophy

CHOMARAT

Jesse Hartzell
Chris Mikesell



McCoy

Kevin Ahlstrom
Davis Ahlstrom
Robin Belk
Tyler Hill



Uday Vaidya



Merlin Theodore
Bob Norris

Montefibre

Alan Liby

Questions?

