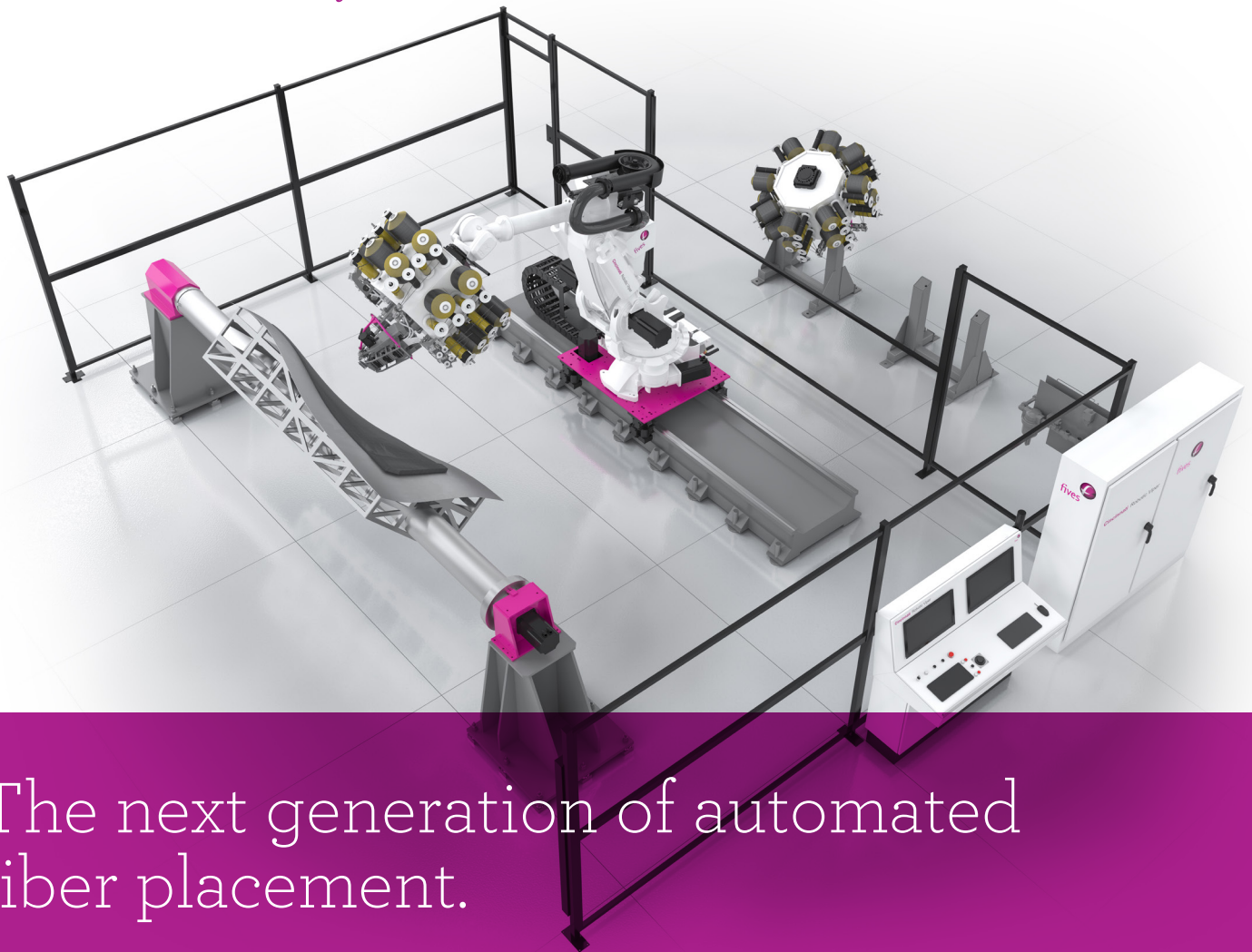


# Cincinnati Robotic Viper

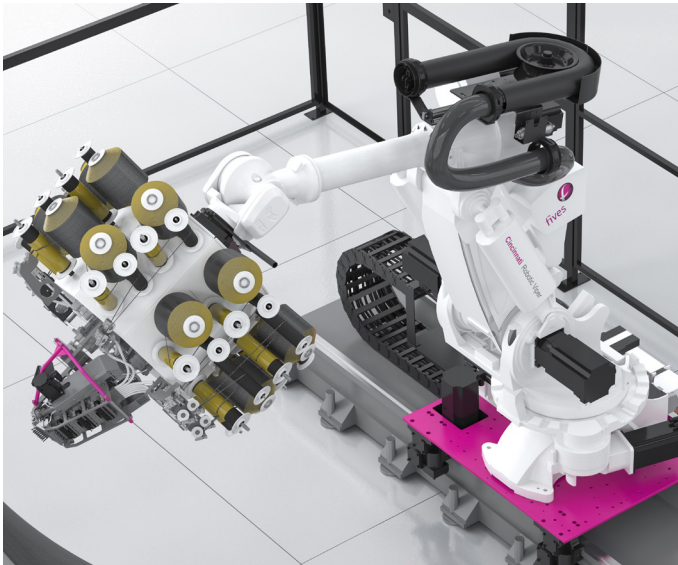
## Fiber Placement Systems



The next generation of automated fiber placement.

- High Reliability Cut/Add Mechanisms
- Accuracy at High Laydown Rates
- Modular Design
- Designed to be backward compatible to previous generation Viper AFP Systems
- In-Process Inspection System

Lower price point without sacrificing the quality, accuracy and reliability of renowned Fives composite equipment.



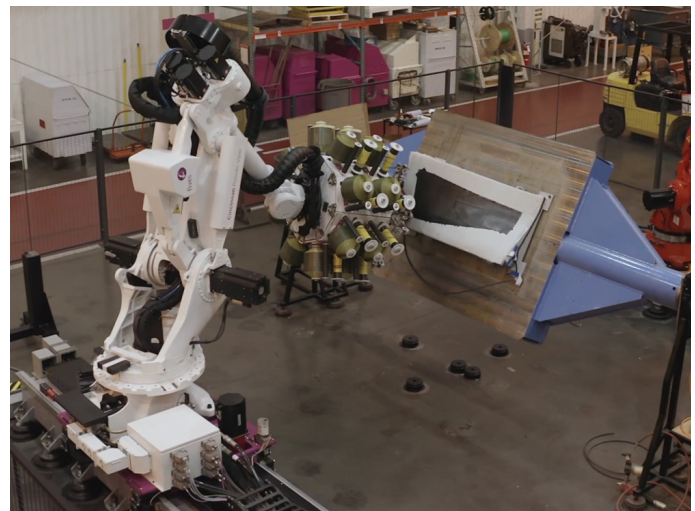
### MACHINE PLATFORMS

- Vertical Gantries, Moving Column, Robotic Arm
- Fixed and Docking Creel designs
- Fixed Tool, Rotating Mandrel
- Modular Head Design
- Multiple Material Widths
  - 1/8", 1/4", 1/2"
- Multiple Material Types
  - UD Carbon, Glass & Kevlar Epoxies, BMI, Out of Auto Clave, Dry Fiber

### TESTING AND PROVE-OUT PLATFORM

- New Feature Capabilities Fully Validated on Test Vehicle at Fives Cincinnati Facility
- Latest Head Technologies to be delivered for all Future AFP Systems
- Head Designed to be backward compatible to previous generation Viper AFP Systems

Functions	Sub-functions	Specifications		
Overall Capability	Material size	Width	3.2mm, 6.4mm, 12.7mm (1/8", 1/4", 1/2")	
		Number of Tows	4-16 (increments of 4)	
	Material Types	Prepeg (tow/slit tape)	Yes	
Application	Creel	Dry fiber	Yes	
		Head docking	Yes	
		Material size	75mm (3") core ID x 335mm (8.5") OD x 300mm (12") long	
Tow Feed/CCR	Add/Restart	Spool weight	2.7 - 7.0kg (6-15.4lbs)	
		On the fly speed	1.0 m/sec	
		Cut	On the fly speed	1.0 m/sec
		Minimum tow length	95mm	
Performance	Clamp	On the fly speed	1.0 m/sec	
		Accuracy	End of tow	+/- 2.0mm throughout velocity range
		Laying	Feedrate	up to 1.0 m/sec
CAM Software		Program and Simulation Software	ACES	
Miscellaneous	Part Probing	Contact or not contact	Yes	
		Ultrasonic trimming	Docking Unit/separate from AFP head	Yes - Optional Equipment
	Process vision	Video	Yes	
	Inspection	Fives in Process Inspection (IPI) System	Yes - Optional Equipment	
		Integrated OLT Inspection System	Yes - Optional Equipment	



The information provided on this document is for information purposes only and does not constitute a legal obligation or a warranty, express or implied, of any kind.

#### CONTACT

Fives Machining Systems, Inc  
 fivesmsi-sales@fivesgroup.com  
 T +1 (859) 534 4600

Fives Machining Systems, Inc  
 2200 Litton Lane | Hebron, KY 41048  
 www.fivesgroup.com



fives  
 Industry can do it