CCM Equipment

- **Autoclave**: Thermal Equipment Corporation autoclave, with capability to 1200 F and 500 psi. Chamber working size is approximately 20in diameter and 4ft in length.
- **Compression Molding Press**: 2ft x 2ft 150 ton Wabash heated platen (800°F) press.
- **Liquid Molding**: Multiple VARTM workcells with all necessary accessories, RTM injection systems, a SMARTMolding fully automated VARTM workcell, elevated temperature VARTM for BMI and toughened epoxy infusion, Co-Injection Workcell, process monitoring sensors, and all associated process control hardware, permeability characterization.
- **Robotic Tape Placement**: ABB 6400 six-axis robot with custom designed heads – Computer-Controlled N2 Hot Gas Torches (2), 10 kW Huettinger Induction heater, IR heaters, all necessary hardware and process control systems.
- **Thermoplastic Extrusion & Film Line**: DACA Micro-Compounder (5cc max capacity), Twin screw Haake Extruder (480 C, 14 kg/hr) and Film line, Perkin Elmer Series 2000 GPC Lab Scale Film Extrusion System.
- **Microwave Processing**: 3kW microwave processing system.
- **Induction Heating**: 5kW heaters for polymer and metal matrix composite processing.
- **Automated Lamination System**: Roller based heating and consolidation system for automated processing of thermoplastic and thermoset prepregs.
- **Ovens**: Wisconsin Oven-Convection Oven 8ft x 10ft x 8ft chamber (500°F), Blue M-Convection Oven 3ft x 3ft x 4ft chamber (500°F).
- **Fabric Prototyping & Tow Sizing System**: CCITech SL8900 Sampling Loom System (2-D Loom, Warper, Sizing Unit).
- **Ultrasonic Welding**: Amtech Ultraceam 20 Robotic Consolidation System.

CCM-ATTL Equipment

CCM’s Application Technology Transfer Laboratory (ATTL) was established in 2005 as an off-site facility to provide additional space for sub-component and full-scale part manufacturing and prototyping. Facilities at ATTL are used to demonstrate production processes at rate and quality.

- **Pultrusion**: HPI 20 kip Pultrusion Machine.
- **Prepreg Line**: Aqueous Bath Thermoplastic Prepreg Line.
- **CNC Automated Ply Cutting**: American GFM Model US15 Ultrasonic ply cutter with fabrication/assembly capabilities of bound dry preforms.
- **Liquid Molding**: VARTM workcells including SMARTMolding with elevated temperature capability, and a 44ft x 14ft x 12ft dedicated climate controlled booth for process condition control and ventilation.
- **Filament Winding**: Entec Filament Winder.
- **Experimental Thermoplastic Lamination Workcell**.
- **CNC Machining**: HAAS VF-9/40 Vertical Machining Center.
- **Spray Systems, Inc. Commercial Spray Booth**: 34ft x 14ft x 12ft.
- **Component Trimming & Finishing**: Specialized composite cutting equipment and dust collection controls.
- **Assembly & Integration**: Large scale composite structures and vehicle applications, including systems integration for electronics and electro-mechanical systems.